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An Address.[1]

By IAN D. GRANT,
President of the College of General Practitioners of Great Britain, Glasgow.

IT is impossible adequately to express my very great appreciation of the high honour you have just conferred upon me. It is indeed the highest honour the College can bestow, and I am very conscious of my own unworthiness of so great a distinction. But I really take this, not as a personal tribute to myself, but rather as an expression of your desire to honour the College of General Practitioners in Britain, of which it is my great privilege to be the second President. From our College I bring you greetings and every good wish for your success and prosperity. To some extent we regard the Colleges of Canada and Australia, the Faculties in New Zealand and, more recently, the very young Faculties in South Africa and Kenya, as our children; and how very proud we are of the place our family occupies in the medical hierarchy of their countries!

We in the Mother College are very gratified that you have, in so short a time, attained sufficient strength to be completely independent—to all intents and purposes you were almost independent even in your toddler years—and we know that you will become an even greater power for good in the medical life of this great Commonwealth. Naturally we shall miss you; but we cannot but hope that many of you may be able to remain members of both Colleges, and to further that aim we, at home, will do everything possible financially to ease the burden of dual membership. But of one thing I am certain, and that is that your close association with the Mother College will always be maintained, and that the ties that bind us together will be strengthened rather than weakened in the years to come. The warmth of your welcome to my wife and myself is abundant proof that you still regard Britain as "home", and that your affection for and loyalty to the Motherland is in no way lessened by the waste of seas which divides us. It is particularly pleasing to me to note the large number of eminent men and women here who have graduated from general practice to high academic distinction and who are members of your College. The conditions under which you practise in Australia permit this transition from general practice to consultant practice. Before the advent of the National Health Service in Britain we were similarly favoured; but now it is practically impossible for a practitioner to move from general to special practice, and this prohibition, I am sure, has not been for the good either of the doctors or of the population. A consultant who has gained wisdom in the management of people as well as in the management of disease is, in my opinion, a greater physician than he who is concerned with patients only as interesting scientific entities.

At our last general meeting it was determined unanimously and with acclamation to invite your first President, Dr. Conolly, to accept Honorary Fellowship of our College. Until this year the only Honorary Fellows of the College were the distinguished consultants and Sir Henry Willink

[1] Delivered at the inaugural meeting of The Australian College of General Practitioners, Sydney, March 20, 1959.

who had been members of our Steering Committee. But this year we felt we should honour ourselves by inviting some outstanding general practitioners to become Honorary Fellows, and those to whom we extend this invitation are Dr. Albert Schweitzer, perhaps the best loved and most famous general practitioner in the world today; Dr. M. R. Stalker, the first President of the Canadian College; Dr. E. S. Jamieson, the first Chairman of Council in New Zealand; Dr. W. N. Pickles, our own first and much esteemed President; and now Dr. Conolly, an outstanding personality to whom our College and your College owe an unpayable debt of gratitude for the time, energy and enthusiasm which he has given ungrudgingly, first in the formation of your Faculties, and now in the establishment on sure and solid foundations of the Australian College. He is indeed a man of much merit, and I am delighted to know that he has accepted our invitation to join our other distinguished colleagues and permitted us to enrol his name in our roll of Honorary Fellows. Honorary Fellowship of our College is not awarded easily or lightly, and I feel sure that you, Dr. Conolly, will esteem this honour—the highest our College can accord—with almost as much pride and pleasure as I esteem the very high distinction which you have conferred upon me today.

As you know, our College was founded on January 1, 1953; but I wonder if many of you realize that an Australian practitioner played—quite unwittingly—a large part in the foundation of our College in Great Britain. Many people have asked: "What led to the establishment of the College?" It is perhaps rather difficult to pinpoint; but for several years, and particularly since the inception of the National Health Service, there was amongst general practitioners a feeling that their status had been debased, that their activities were being restricted, and that in many cases they were merely acting as signposts to the nearest hospital.

The publication of the Collings Report, after a survey of practices in England, Scotland, Wales and Northern Ireland, aggravated that feeling of uneasiness. It was recognized that many of the criticisms in the report were factually correct, and that there was a real danger that general practitioners were becoming academically isolated, and that many of the standards and traditions of good general practice might be lost. On the medico-political side, the interests of general practitioners were in the very capable hands of the General Medical Services Committee, and on matters of terms and conditions of service, a highly skilled and efficient organization had been built up by the British Medical Association.

But in so far as scientific and academic matters were concerned, general practitioners had for many decades just muddled or drifted along. Those who were keen clinicians and had taken higher qualifications frequently obtained hospital posts; but with the coming of the National Health Service and the vast increase in the number of hospital posts of the registrar and senior hospital medical officer grade, the general practitioners were edged out, left out and, in many cases, after years of service to a hospital, pushed out. From the academic standpoint they were completely unorganized, and they had no organization of the standing of the Royal Colleges to put forward their claims or their aspirations. Gradually, an ideal was taking shape that a college of general practice would inspire practitioners to regain their rightful place in the medical hierarchy.

As a result of the interest aroused by the Collings Report, in the year 1950-1951 the General Practice Review Committee was in session, and the final results of its deliberations were published in the Hadfield Report. In September, 1951, two general practitioners, Dr. Fraser Rose, from industrial Preston, and Dr. John Hunt, from fashionable Mayfair, presented memoranda to the Committee, both stressing in almost identical terms the need for a college of general practitioners. These memoranda occasioned widespread interest, and numerous doctors wrote in commending the project by a majority of 50 to one. Encouraged by this, a Steering Committee was convened under the chairmanship of Sir Henry Willink, a former Minister of Health.

The conclusions of the Report of the Steering Committee may be of interest to you:

> General practice is the oldest branch of medicine; over 80% of this country's illness is cared for by family doctors and here, as in our great Dominions and the United States of America, it has been found that one of the most difficult tasks in medical administration and planning has been to find the proper role of the general practitioner in modern medicine. There is taking place now a world-wide reorientation of ideas about his capabilities and responsibilities with a steadily growing conviction that general practice is fundamentally as important as the specialties and that it cannot be controlled by specialist organizations. General practitioners have been, in the past, and must be in the future, good doctors practising medicine in their own right; they are essential to the heart and soul of medicine. It is being increasingly realized that this development and emancipation of general practice is not only a question of professional pride and status, but is an urgent economic need—to keep patients out of hospitals whenever they can be investigated and treated at home. [In passing, a hospital bed now costs anything from £18 to £30 per week.] Only by developing a higher standard of general practice, with full access to hospital and laboratory facilities, can the present overcrowding of out-patients and increasing specialist consultations be avoided.
>
> A golden opportunity now presents itself for general practitioners to found an organization of their own to watch over their academic interests, their privileges and their education. No existing body is doing now, or will be able to do in the future, what is required. The formation of a new college to lead general practitioners and to uphold their rightful place in the National Health Service will help them more than any existing organization can do, and the influence of such a college for the good of general practice cannot fail to be profound.

With these high ideals to inspire them, the Foundation Council got to work. The following committees were appointed: (i) finance and general purposes; (ii) postgraduate education; (iii) undergraduate education; (iv) research.

To ensure the successful inauguration of a college requires a secretary of vision and of driving force. The success of our College has been due in very large measure to the initiative, ability, charm and vision of John Hunt. He was responsible for the formation of the Steering Committee, for the selection of the right individuals and for enlisting the support of the leaders of medical organization, and for the secretarial work. This has imposed a tremendous burden on his time and energy, but he has always proved more than equal to the demands made upon him. It has been said that, in times of stress and difficulty, a leader always arises, and we in our College can truly say that the unselfish leadership of John Hunt has been a major factor in our successful progress. You in Australia are equally fortunate. In Dr. Saxby it is obvious that you have a secretary of drive, personality and enthusiasm—a man of much merit who, in his determination to make your College the Mecca to which all good practitioners will be drawn, is closely akin to our John Hunt and Canada's Victor Johnstone.

We do not contend that members of the College are better doctors than those who are not with our ranks; but we do say that our aim is to make good doctors better doctors, and that membership of the College will ensure that one meets those men and women who are anxious to maintain and improve their knowledge of modern advances in diagnosis and treatment, and who promise to undertake an agreed number of hours of post-graduate study every year. When one mixes with enthusiasts, one becomes enthusiastic too, and enthusiasm for his job is the first prerequisite of a College member.

It is sometimes good to recall history. In 1845, an attempt was made to found a college of general practitioners, and at a meeting of 1200 practitioners, it was decided to found a "National Association of General Prac-

titioners in Medicine, Surgery and Midwifery". The feeling of the meeting was ardent, enthusiastic and unanimous; but many irresponsible and, indeed, unforgivable blunders were made. Of its first council of 60 members, only one resided outside London. This aroused much indignation, especially amongst country practitioners, and a good deal of opposition from the Royal Colleges of Physicians and Surgeons, who felt that the new association might weaken their authority. A vast amount of argument ensued in the medical journals of the day, and it was finally agreed that the College of Practitioners might be founded as an equal College with the two existing Colleges. But the virtual exclusion of country practitioners from their council caused the proposed College to lose its nation-wide attraction, and in 1846, a year later, the project was dropped, and the Royal College of Surgeons opened its doors to those general practitioners who were at that time interested in surgery, and general practitioners as a class again sank deep into the slough of despair.

Our young College received an enthusiastic welcome from almost every body associated with medical education and even with medico-political affairs, and from many overseas societies and associations. The young College was determined not to make the mistakes of 100 years ago, and the first Foundation Council—admittedly self-selected—was elected on a geographical basis. Some of the members had considerable experience of British Medical Association activities, and were able to help in determining constitutional difficulties; but the great majority were men to whom the College was their initiation into administrative work, and they approached our problems with an entirely open mind, with no preconceived ideas about constitution. Two guiding principles were: (i) not to interfere with the work of other medical organizations; (ii) to avoid medical politics and to restrict College activities to the academic and educational aspects of general practice.

A liaison committee of four College and four British Medical Association members was instituted to discuss ways in which the two bodies, the British Medical Association and the College, could be of mutual assistance and help to general practitioners, and to exchange views on any problems common to both. It was thought that the work and activities of the College should be complementary to, and not in competition with, the work already being undertaken by the British Medical Association.

With regard to the Royal Colleges, it was, from the beginning, made clear that a College of General Practitioners would in no way interfere with the activities of the Royal Colleges. It will perhaps run parallel with them, but it will not compete with them.

We are all striving for the same goal—to give to the people of our countries the best medical service that can be provided; a renaissance of general practice with its own headquarters directing it cannot but benefit every branch of the medical profession in the country. There should be no conflict between specialists and practitioners. Both have their own particular tasks; both are of equal value to the community; neither group can replace the other, both are essential and both are complementary, the one to the other.

I am one of those who firmly believe that the good general practitioner is of just as much value to the community as is the good consultant. His work is less spectacular; he is not surrounded by a train of attendant acolytes, and he is unable to perform the dramatic operations of the great surgeon, but he should exercise a very great influence for good in the life of the community. He should be the trusted confidant and adviser of his patients. In many cases he has known these patients from their infancy. He is aware of their virtues and their vices. He has treated their childhood illnesses, and he knows how these may affect the diseases that arise in later life. He should be their first line of defence against illness. He can treat satisfactorily more than 80% of the ills to which they fall heir; but he should know his own limitations, and refer his patients for expert advice when he feels that is necessary. He should dissuade patients from rushing without his knowledge and consent to the pundits of Harley Street and Macquarie Street. There is nothing worse for a patient than a consultation with the wrong consultant. In these days of very highly specialized knowledge, we have come to the pitch where many specialists know more and more about less and less, where they become a little one-track-minded, and where they, quite unconsciously, tend to attribute the onset of all disease to some impairment of function in their particular specialty. To the patient I would say, before going to a specialist first consult your general practitioner. No good practitioner will take umbrage at your wish for a second opinion, and every good consultant will welcome the past history that can be given only by the practitioner. After his full investigation and consultation are over, he will appreciate a frank and full discussion with a general practitioner on both diagnosis and line of treatment.

I can often recall the patient who went direct to an eminent consultant, who was unaware of his allergy to certain drugs, and who prescribed these drugs, with very great discomfort to the patient and considerable damage to his reputation in that patient's circle of friends.

A perfect partnership on terms of complete equality between general practitioner and consultant is the aim we should all seek to achieve. From the general practitioner we require the acknowledgement that the consultant is preeminent in his own sphere, and from the consultant we require recognition that the general practitioner has a wealth of experience that is acquired only by a deep and profound knowledge of people with all their personal idiosyncrasies and problems. I can always remember attending the funeral of an old and honoured country practitioner; as the coffin was lowered into the grave, one of his colleagues said: "There is an awful lot of knowledge which can never be replaced going down with that coffin."

I feel confident that this Australian College of General Practitioners will play an important part in providing an academic forum for the general practitioner from which to voice his aims and aspirations. It will ensure that graduates of the future will have some knowledge of the work undertaken by general practitioners; it will establish a research unit—not in competition with the high-powered existing bodies working under the ægis of the Medical Research Council, but a unit which will undertake patient investigation into those diseases which come peculiarly within the province of general practice, as first exemplified by the late Sir James Mackenzie in his epoch-making studies on diseases of the heart; it will provide post-graduate classes on subjects which are essentially of interest to the general practitioner; and it will, I hope, provide an opportunity for consultants and practitioners to meet and discuss their problems on terms of complete equality. General practice is that branch of our profession which brings the greatest benefits of modern medicine to the broadest cross-section of the public. To every patient we bring some specialized knowledge, and to many patients we bring the only measure of specialist medical care they are ever likely to need. As the consultant brings his skill to treat the small number of critically ill persons, so we, as general practitioners, should strive to increase our ability to keep the great multitude of others from reaching that critical illness.

Floreat Collegium Australe!

REPORT ON A SURVEY OF ALLERGIC REACTIONS TO PENICILLIN.[1]

THE objects of the survey were: (i) to determine the incidence of reactions to penicillin when administered by injection or oral tablet; (ii) to record the type of such reactions and their clinical features; (iii) to observe if any relationship exists between the occurrence of reactions and (*a*) the type of penicillin used, e.g., penicillin for oral administration, crystalline penicillin, procaine penicillin, and benzathine penicillin; (*b*) the proprietary preparation used.

[1] An investigation conducted by the Research Committee of the N.S.W. Faculty of The Australian College of General Practitioners. Recorder: N. A. Andersen, Fairfield, N.S.W.

METHOD OF SURVEY.

Members of the research register of the N.S.W. Faculty of The College of General Practitioners (now The Australian College of General Practitioners) were asked to cooperate in compiling the series from their own records of patients treated: 36 doctors cooperated and supplied the material for the series. The survey officially began on September 1, 1959, and concluded on June 30, 1958. A few practitioners were able to commence recording a little earlier than the official starting time, and one practitioner was able to provide adequate records covering the previous three years.

Each practitioner participating was requested to record the age, sex, diagnosis and penicillin preparation used, for each patient given penicillin throughout the period of the survey. He was provided with a detailed *questionnaire* to be completed for each patient who developed a reaction to penicillin.

MATERIAL FOR ANALYSIS.

A series of 6832 patients given systemic penicillin was compiled. Reports on 93 patients with a reaction were also received. One of these was subsequently excluded from the series as the referring doctor considered the allergy could have been due to concurrently administered sulphonamide. One other case record was found to describe a reaction to skin contact (accidental spraying of procaine penicillin onto the face and arms when an intramuscular injection was given), and so was not further considered. Three other reports of penicillin reactions were not accompanied by a concurrent series of patients given penicillin, so were not included when the incidence of reactions was calculated.

RESULTS.

Incidence of Penicillin Reactions.

The series comprised a total of 6832 patients given systemic penicillin. Of these, 2874 were males and 2432 were females. The sex of 1526 patients was not stated.

From this series, there occurred a total of 88 reactions to penicillin. These comprised 60 males, 27 females and one patient whose sex was not indicated. The incidence of penicillin reactions in this series was thus 1·3%, and the male:female ratio of the penicillin-sensitive patients was 2:1. This variation in the distribution according to sex is statistically significant ($\chi^2 = 7{\cdot}804$, which is significant at 1%), though it should not be forgotten that within the total series, 1526 patients were not classified as to sex—a rather high proportion. No age group was exempt.

Type of Reactions and Clinical Features.

For the purpose of this analysis, patients were considered as suffering from either an immediate or a delayed reaction. An immediate reaction is defined as one which appears within 30 minutes of administration. Delayed reactions were grouped according to the extent of delay. The incidence of these types of reactions is shown in Table I.

Immediate Reactions.

As seen in Table I, there were seven patients who suffered an immediate reaction in the series of 91 allergic responses. Analysis of the records provided reveals the following:

Type of Penicillin Used.—Procaine penicillin was used in five cases, crystalline penicillin in one case and benzathine penicillin in one case.

Allergic History.—(i) Previous penicillin therapy. Six patients had previously received penicillin by injection, and three of these had previously experienced a reaction to the penicillin used. (ii) Other personal allergy. One patient had suffered an allergic reaction to sulphadiazine, and another had a history of strong allergy to "diphtheria injections" and tetanus antitoxin. (iii) Family allergic history. Only one patient had a history of allergy occurring in another member of his family. This relative had previously demonstrated sensitivity to penicillin.

Sex.—Of the seven patients under consideration, six were males and only one was a female.

Clinical Features.—The possibility of accidental intravenous injection of penicillin was admitted in the case of one patient, who developed a severe, almost fatal, collapse with a recurrence of collapse symptoms two hours later. This patient, a young adult male (aged 21 to 30 years) had received penicillin previously without ill effect. He did not have any positive allergic history. One patient had moderately severe anaphylaxis. Four patients sustained a mild anaphylactic response. One further patient developed urticaria 20 minutes after receiving his injection. This disappeared 12 hours later.

TABLE I.

Type of Reaction.

Reaction.	Number of Cases.
Immediate	7
Delayed:	
Less than 24 hours	24
1 to 7 days	33
8 to 14 days	14
Over 14 days	8
Period not specified	10
Total	91

Thus the patients with an immediate reaction can be summarized as follows: severe, nearly fatal anaphylaxis, one patient; moderately severe anaphylaxis, one patient; mild anaphylaxis, four patients; urticaria only, one patient.

It is interesting to note that one patient, who developed a mild immediate reaction, did so when given a skin test of 1·0 minim of crystalline penicillin (300,000 units per millilitre). He had previously reacted to penicillin, and without doubt his life would have been in jeopardy had a full dose been given.

Delayed Reactions.

There were 84 examples of delayed reactions available for analysis.

Type of Penicillin Used.—Table II shows the number of reactions occurring with different types of penicillin.

TABLE II.

Number of Reactions to Different Types of Penicillin.

Penicillin Used.	Number of Reactions.
Procaine penicillin	63
Crystalline penicillin	4
Benzathine penicillin	5
Penicillin for oral administration	3
Unknown	2
Combined forms	7

Of the seven patients who had been given combined forms of therapy, e.g., crystalline penicillin followed by procaine penicillin or procaine penicillin followed by a benzathine preparation, four had received a benzathine form. Thus, benzathine penicillin was involved in nine of the 84 cases of delayed reaction.

Allergic History.—(i) Previous penicillin. No details concerning the administration of previous penicillin were available in 10 cases. Of the remaining 74 patients, 47 (63·5%) had previously received penicillin therapy. Of these, seven had had a previous reaction. (ii) Other personal allergy and family allergic history. Twelve patients had a previous history of some form of allergic response (e.g., asthma, hay fever, hives, urticaria, reaction to drugs other than penicillin). In 24 cases there was a family history of allergy, whilst a further 11 patients had both a personal and a family allergic

history. Thus 47 patients had an allergic background, either personal, familial or both. There was no such history in only 23 cases, whilst details were not available in 14 cases. An allergic background could be demonstrated in 47 of 70 cases, an incidence of 67%.

Sex and Age.—Of the 84 delayed reactions, 57 occurred in male subjects and 26 in females. The sex was not stated in one case. All ages were affected, though the majority of patients (72) were aged less than 50 years.

Symptoms and Signs.—These are listed in Table III. Only three patients suffered recurrences.

TABLE III.
Symptoms and Signs.

Clinical Features.	Number of Cases.
Fever	9
Arthralgia	20
Skin signs:	
Bullæ	4
Erythema	46
Purpuric spots	1
Urticaria	64
Subsequent desquamation	11
Mouth signs:	
Dryness	3
Oral bullæ	1
Respiratory signs:	
Laryngeal obstruction	2
Bronchospasm	2
General collapse (coldness, sweating, etc.)	9
Paræsthesiæ	2

Type of Penicillin and Proprietary Preparation Used.

In the whole of the series of patients given penicillin, the number of patients receiving various preparations is given in Table IV. The table also shows the number of patients developing a reaction to the type of penicillin used.

Table IV shows that 4763 patients received procaine penicillin and that 68 of these patients developed an allergic response. A particular brand of procaine penicillin was used in 2002 cases, and in this sub-group there

TABLE IV.
Number of Patients Receiving and Number of Reactions to Different Types of Penicillin.

Penicillin Used.	Total Number of Patients.	Number of Reactions.	Percentage Incidence.
Procaine penicillin	4763	68	1·4
Benzathine penicillin	159	6	3·8
Crystalline penicillin	287	5	1·7
Penicillin for oral administration	566	3	0·5
Combined injections—			
Crystalline and procaine, procaine and benzathine	134	7	2·0
Procaine penicillin and penicillin for oral administration	210		
Penicillin and streptomycin	7	—	—
Unknown	706	2	—
Total	6832	91	1·3

were 43 examples of sensitivity reactions. Among the remaining 2761 patients receiving other brands of procaine penicillin there were only 25 further examples of sensitivity reactions.

It was expected that the majority of patients reacting would be patients who had received a procaine penicillin preparation. These results suggest further that reactions are rather more likely to occur when the most commonly used preparation is involved ($\chi^2 = 12{\cdot}73$, which is significant at 1% level). It will be recalled that five of the seven immediate reactions also occurred after the administration of procaine penicillin.

Penicillin for Oral Administration.

There were three patients who developed a reaction after the use of a preparation of penicillin for oral administration. Two of these patients were given phenoxymethyl penicillin. The reaction consisted of the appearance of an erythematous rash with or without urticaria, and in two cases the reaction appeared after five and six doses respectively. Recovery was complete with no recurrences.

One of these patients had a significant allergic history.

A women, aged 31 to 40 years, had suffered previously from hay fever, and was reported as having experienced reactions to gold. She had a maternal history of asthma. Unfortunately she had also been given a mixed sulphonamide preparation simultaneously with her penicillin, and there must remain some doubt as to whether the reaction reported was due to penicillin or to the sulphonamide.

Benzathine Penicillin.

A benzathine penicillin preparation was given to 10 patients who sustained an allergic reaction. Details of these patients are given in Table V.

TABLE V.
Reactions to Benzathine Penicillin.

Type of reaction:			
Immediate			1
Delayed			9
Allergic History:			
1. Previous penicillin			8
By injection	6		
Topical use	1		
Injection and topical use	1		
2. Previous reaction to penicillin			0
3. Personal allergy (e.g., asthma)			5
4. Family allergies			5
5. No personal or family allergic history			2
Sex:			
Males			7
Females			3
Recurrence of symptoms			4

It is interesting to note that skin tests were performed on only one of the 10 patients, namely, the one patient who developed an immediate reaction. The tests were performed after the reaction had occurred, and gave negative results.

DISCUSSION.

Incidence.

There were 88 patients with sensitivity reactions in this series, an incidence of 1·3% of those receiving penicillin therapy. This represents a minimum figure, as it is possible that a number of reactions were not reported by the patient to his doctor. Other reported series quote an incidence of up to 4% to 5%, whilst two writers state that penicillin has become the primary problem in drug allergy (Feinberg and Feinberg, 1956). Whether this remains true has yet to be determined, but considering the diminishing use of penicillin in staphylococcal infections, it is likely that the problem of sensitivity reactions will diminish. Nevertheless, the possibility of such reactions will remain as long as penicillin is used in therapy.

This series does bring to light two significant points concerning the occurrence of sensitivity reactions. Whilst the sexes are approximately equally divided amongst the series of patients treated with penicillin, amongst those who reacted, males exceeded females in the proportion of 2:1.

Further, the results underline the significance of (i) a history of previous penicillin therapy, (ii) a history of previous reaction to penicillin and (iii) other allergic history. For example, of the seven patients who experienced an immediate reaction, six had previously been given penicillin, and of these, three had previously developed an allergic response. The importance of establishing this history, if present, before the administration of penicillin, is obvious. Of 74 patients who

developed a delayed response, 47 (63·5%) had previously been treated with penicillin, while 67% of the patients had an "allergic" background.

Clinical Features.

This series does not reveal any new information regarding the clinical features of allergic responses to penicillin. Reactions were easily classified as immediate or delayed, and the most common features of the latter were as expected — urticaria, erythematous rashes, arthralgia and later desquamation.

Reactions of the delayed type are classically said to occur after an interval of 7 to 10 days. It is interesting to note that in this series, 24 patients reacted in the first 24 hours (excluding "immediates"); 33 patients reacted during the first week, and a further 14 reactions occurred during the second week.

It should also be recalled that one patient classified as having an "immediate" reaction did not develop anaphylaxis, but did develop urticaria. In other words, he may be regarded as having a true "accelerated" reaction, of the serum sickness type, rather than anaphylactic in type.

Information was sought as to whether albuminuria occurred during the course of a reaction. No affirmative answers were obtained, but it is possible that urine examination was not performed in a large majority of these cases.

Type of Penicillin.

No further comment need be made here except to draw attention to two facts. Firstly, reactions do occur when oral preparations are used, though perhaps less often. Secondly, reactions to benzathine penicillin in this series showed a higher incidence of occurrence than did the over-all series. However, the figures are small and no dogmatic statements should be offered on this, but they do suggest that benzathine preparations are more likely to provoke a reaction. What is of significance, perhaps, is that of 10 patients receiving benzathine penicillin and subsequently experiencing a reaction, there were three who sustained recurrence of symptoms. In fact there were only eight cases in which symptoms recurred after the cessation of treatment in the whole series, and of these, three had received one of the most commonly used benzathine preparations.

The Prevention of Anaphylaxis.

Reactions of the delayed type rarely constitute a threat to life. On the other hand, anaphylaxis not uncommonly causes death. In the present series, one patient nearly died while another developed anaphylaxis to a test dose of 1·0 minim of crystalline penicillin (300,000 units per millilitre). In a leading article of the *Journal of the American Medical Association*, 1958, the writer reviewed a nation-wide survey of severe reactions to antibiotics, reported at Washington D.C. in October, 1957. He stated that penicillin was the responsible agent in 84% of severe or life-threatening reactions reported, and that the mortality amongst these severe reactions due to penicillin was 9%. Of 901 patients with severe reactions 83 died.

An attempt should always be made to assess the likelihood of any patient's developing a dangerous reaction, before the administration of penicillin. Numerous investigations have attempted to define a suitable testing technique, which could be used for this purpose. It would appear to be generally agreed that skin testing is of no value in predicting the occurrence of delayed reactions of the serum sickness type. However, Vernon Smith (1957) describes two tests—scratch and conjunctival, using a full strength preparation — and concluded that a positive response indicated the possibility of a severe immediate reaction. A positive response to the skin test consisted of an erythema of more than 1 cm. in diameter or a wheal or both, occurring within 20 minutes, while a positive result to the conjunctival test consisted of itching, redness or œdema, also occurring within 20 minutes. He advised that these tests should always be used before the first injection of penicillin is given, and that if the response is positive then the patient should be further investigated and that penicillin be withheld, pending the results of further investigations.

After reviewing the literature, Tuft and others (1955) advised intracutaneous injection of 0·02 ml. of 10,000 units per millilitre, together with a control test of the diluent or vehicle. While differing in technique, they agree that a positive immediate response suggests the possibility of dangerous allergy and that no reliance can be placed on delayed positive results.

All writers are agreed that a negative result does not exclude the possibility of anaphylaxis occurring, but Vernon Smith's results suggest that the large majority of patients at risk would give a positive result to the test.

Skin testing was apparently carried out on only three patients in the present series. In one case, the test dose was 1·0 minim of full strength (300,000 units per millilitre) crystalline penicillin, and as recorded above, the patient sustained a mild anaphylactic reaction. The remaining two patients were both tested after they had recovered from their reaction. The results of the tests were strongly positive in one but negative in the other.

Skin testing as described by Vernon Smith may be advisable, but in view of the time involved, is unlikely to become a standard routine procedure. However, our results suggest that if proper cognizance is taken of a history of previous reaction to penicillin, or of the previous administration of penicillin, particularly in patients with an allergic background, then the risk of an anaphylactic response can be significantly reduced. It may be that skin testing should be applied to all patients with such an allergic history.

Summary.

A survey of the occurrence of reactions to penicillin carried out by the N.S.W. Faculty of The Australian College of General Practitioners is reported. The method of conducting the survey is described and the results are tabulated. The significant results are as follows.

1. Of 6832 patients given penicillin, 88 (1·3%) developed a reaction.

2. The proportion of males to females amongst these allergic patients was 2:1.

3. There were seven immediate reactions in the series; of these, six patients had previously received penicillin and three had in fact sustained a previous reaction.

4. There appears to be a somewhat greater risk of a reaction occurring when a benzathine preparation is used. Further, in these cases, there is probably a greater risk of symptoms recurring after the cessation of treatment.

The importance of attempting to assess the likelihood of a patient's developing an anaphylactic reaction is stressed. To this end, testing doses per skin scratch and conjunctival sac technique may be advisable. The presence of a history of a previous reaction is always significant as is a history of previous penicillin therapy with no former reaction. Patients with an allergic background, e.g., asthma, should also be viewed with suspicion.

Acknowledgements.

The author and the Research Committee are indebted to Professor H. O. Lancaster for his advice and the statistical analyses. Appreciation is also expressed to the 36 doctors who made this survey possible.

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PROGRESS IN ELECTRICAL ANÆSTHESIA: A CRITICAL REVIEW, 1902 TO 1958.

By VAL STEPHEN,
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COMPARED with other methods of anæsthesia, there seems to be a very limited amount of research on the production of satisfactory surgical anæsthesia by electrical means.

Electronarcosis, as a mode of therapy, has been used in psychiatric conditions, but has fallen into disuse, owing to the more satisfactory results with electroconvulsive therapy.

From the historical point of view, the first serious attempts were performed in France by Professor Stephane Leduc (1902). He experimented upon animals, and also used himself as an experimental subject. He used a uni-directional pulsating current, but succeeded only in producing a "nightmare state", with partial unconsciousness and generalized paralysis rather like the curarized state. In animals, when he attempted to increase the current, he produced convulsions and often death. Zimmern (1903), who continued the work, stated that electro-sleep did not exist. However, Foveau de Courmelles (1936), believed that loss of consciousness was possible, but could not prove it in animals.

Professor Leduc later used an alternating current of 50 cycles per second frequency from an apparatus capable of delivering 250 milliampères, but with little better results.

Tuffier (1907), a surgeon in Paris, in cooperation with Jardry, actually performed an operation on a human subject under electrical anæsthesia; however, they were hampered by muscular twitching and the onset of convulsions.

From this time until the 1930's, not much work was performed in this direction in the English-speaking countries.

Professor W. E. Burge (1936, 1940, 1941) performed experiments in which a frog was attached to an electrostatic machine; one leg was made electro-positive, and the negative electrode was brought about 4 in. from the head. As the cerebral cortex became electro-positive, there was decreased irritability, and loss of consciousness occurred. Burge also discovered that in anæsthetized dogs, the exposed brain was electro-positive in light anæsthesia and electro-negative in deep anæsthesia. He stated that anæsthetic agents affected the potential of the cerebral cortex, rendering it electro-positive and hence inactive, and so producing unconsciousness.

A year after Burge's first publication, E. A. Spiegel (1937) developed electroconvulsive therapy as an improvement on the use of such drugs as "Triazol" and "Cardiazol" in the treatment of psychiatric disorders. Generally speaking, the use of electricity as an anæsthetic agent rather than as a form of therapy had little support at that time.

Several years later, Paul Ross (1943) conducted some experiments in animals with interrupted unidirectional current, using the cathode on the head and the anode near the tail. With frequencies between 80 and 470 cycles per second, a voltage varying from zero to 17 volts and a current-strength of up to 10 milliampères, he failed to produce satisfactory anæsthesia, owing to muscular twitching and clonus. His optimum results were obtained when he used 10 volts at a frequency of 100 to 120 cycles per second.

Frostig *et alii* (1944) continued experiments in electronarcosis in both animals and man. With dogs he tried an alternating current of 60 cycles per second with the electrodes applied to the head. He passed a current of 300 milliampères for 10 seconds, later reducing this to 50 milliampères for a further 10 seconds. With this technique he obtained marked extensor spasms and often cardiac arrest, from which the animals only sometimes recovered. If the current was kept at between 50 and 70 milliampères, respiration usually returned. The highest level of current that did not stop respiration was the narcosis level. Frostig found that there were two distinct types of narcosis in animals: (*a*) the narcotic type, in which the animal slept; (*b*) the kinetic type, with muscular twitching and clonus. Later, using human beings as subjects, Frostig continued his experiments in electronarcosis, using the same technique as he did with dogs; but with a smaller initial current of 150 to 250 milliampères for 30 seconds, he commenced narcosis, and then decreased his current to 45 to 90 milliampères to maintain it with respiration present. Ths technique resulted in the production of initial flexor spasms, followed by a phase of rigidity with cyanosis, and on the reduction of the current, respiration returned with the cessation of cyanosis. At this stage all reflexes were absent, and there was some semi-voluntary activity, such as attempts to roll over or remove the electrodes. He restricted the time of application of the current to five minutes. Frostig also experimented with different placement of the electrodes. In dogs there was little difference, because of the small size of the brain. In humans the only difference occurred with very low placement, when salivation became excessive. In his experiments on humans, Frostig found that too high an initial current often produced cardiac arrest, which was usually reversible on stoppage of the current. He found also that there was a marked rise in the blood sugar level after coma, often to double the normal level. This was probably due to sympathetic stimulation. Both the red and the white blood cell counts were increased, and the carbon dioxide combining power of the blood was decreased.

At Melbourne University, Rose and Rabinov (1945) conducted some experiments; they used interrupted direct current, and varied the parameters. As subjects they used rats, rabbits, cats and dogs, and also a limited number of human subjects. In the animal experiments they used the fronto-sacral placement of electrodes, and optimum results were obtained using 70 volts at a frequency of 100 cycles per second. With the series of animals used, they found that the higher up the animal was on the evolutionary scale, the better was the result.

Patterson and Milligan (1947) obtained very similar results, using alternating current with a frequency of 60 cycles per second. They used a rheostat to control the current intensity, which initially was 160 milliampères, and was then reduced to 65 milliampères to allow respiration to reappear. Their various experiments were limited to seven minutes' duration. Like all others, they were hampered by muscular twitching and clonus.

Later, Medlicott (1954) used electronarcosis as a form of therapy, continuing on after he had administered electroconvulsive therapy. However, he used it only as a form of therapy, and not as an anæsthetic agent. He experimented with three different types of current: (*a*) alternating current (sine wave), (*b*) uni-directional pulses and (*c*) current delivered by Reiter machine (spike waves).

O. V. Kerbikov (1955), the director of the Psychiatric Clinic of the Second Moscow Medical Institute, produced electro-sleep, as he refers to it, using direct current on short pulses of 0·2 to 0·3 millisecond at the slow frequency of from one to twenty cycles per second. He used electrodes in the orbito-occipital position. The current passed was small, from 5 to 15 milliampères. With this technique, the patients gradually became sleepy after 5 to 15 minutes. The mechanism of this action is not fully explained; it may be due to conditioning. Both Gilyarovsky (1952) and Servit (1954) believe it to be due to direct stimulation of the sleep centres of the brain with a suggestion of cerebral central action, because, with this form of therapy, presenile patients often get worse. Another suggestion is that it is due to weak rhythmical stimulation of peripheral receptors, as sleep can sometimes be produced by weak rhythmic applications of current to the forearms.

A year later, Knutson, Tichy and Reitman (1956) furthered the study of electrical anæsthesia in both animals and man. They attempted to reduce the previously observed complications of cyanosis, bradycardia, cardiac irregularities, cardiac arrest and also the tetanic and clonic contractions of muscles. Their earlier experiments were with animals, but later were extended to human beings. Cardiac irregularities and bradycardia were abolished by the adequate use of atropine, and muscular spasms were reduced by an intravenous use of gallamine triethiodide ("Flaxedil"). This enabled an endotracheal catheter to be inserted to maintain adequate oxygenation. In their experiments on dogs, they used electrodes on the head and an alternating current of low voltage (15 volts), which passed a current of from 50 to 100 milliampères. They raised the frequency of the current above that of earlier workers, up to 700 cycles per second, to avoid muscular tetany. Twenty-five dogs were anæsthetized by this method for a period of three hours. Cephalic blood samples were taken at regular intervals during this period, and also afterwards, and sent for analysis. There was no change in the serum potassium, calcium, chloride or sodium levels. The blood sugar level, however, was raised, as a result of stimulation of the sympathetico-adrenal and vago-insulin systems. The blood urea nitrogen level also rose somewhat. The blood pressure rose abruptly with the onset of anæsthesia. After 72 hours the dogs were killed, and serial sections of their brains were examined. There was no demonstrable brain damage either macroscopically or microscopically.

In their human experiments, all subjects were patients in mental institutions, and all had had previous electro-convulsive therapy. Control electrocardiograms and electroencephalograms were done before and after anæsthesia. The electrodes were applied over the temples. Intubation was performed as soon as anæsthesia was commenced, so that controlled respiration could be applied. Blood pressure was taken at regular intervals, and the heart was auscultated continuously. Five patients were anæsthetized by this method, but at the critical current for adequate narcosis there appeared an undue rise in blood pressure up to 200/120 mm. of mercury; this was followed by a precipitous fall of blood pressure on cessation of the current. Ganglion-blocking agents were tried in order to overcome this rise, but they also produced an alarming drop in blood pressure—far more than one would expect from these agents alone. As a result of these complications with blood pressure, human experiments were abandoned. However, it is interesting to note that in this work they used only one frequency, namely, 700 cycles per second; perhaps variation of this factor might have minimized their problems.

Discussion.

In the use of electronics for the production of anæsthesia, one must bear in mind that there are many variable parameters to be considered: (*a*) voltage, and hence the current passed; (*b*) whether an alternating current, a direct current or a pulsating uni-directional current is used; (*c*) frequency, if an alternating or a pulsating current is used; (*d*) wave form of current, namely, sine wave, saw tooth wave, square wave, pulse wave, complex wave; (*e*) envelope of current (rate of onset and decay); (*f*) possible use of more than one frequency simultaneously, e.g., high frequency square wave either amplitude or frequency modulated by a slow wave; (*g*) location of electrodes; (*h*) possible use of multiphasic currents and multiple electrodes to obtain some localization of action of the current.

It seems quite possible that a suitable combination of the above-mentioned parameters may be discovered, which will produce a state of anæsthesia suitable for surgery. With the advances in electronics, suitable generators of current can be produced, in which all the factors mentioned can be varied at will.

In view of the Russian work in electro-sleep (Liberson, 1957), using very low voltage and slow waves which may coincide in frequency with the patients' own alpha waves (Sereisky, 1956), it may be possible to use such currents suitably amplified to modulate higher frequency waves and so produce adequate anæsthesia associated with surgical relaxation.

When one considers the various theories of the production of anæsthesia, it becomes hard to correlate these ideas in terms of electrical stimulation. The various theories are summarized as follows. (*a*) The lipoid theory (Meyer, 1899, 1901). This concerns the solubility of anæsthetic agents in fat, compared with their solubility in water. (*b*) Surface tension or adsorption theory (Traube, 1904; Lillie, 1909; Warburg, 1921-1930). This concerns the ability of anæsthetic agents to lower surface tension and so alter

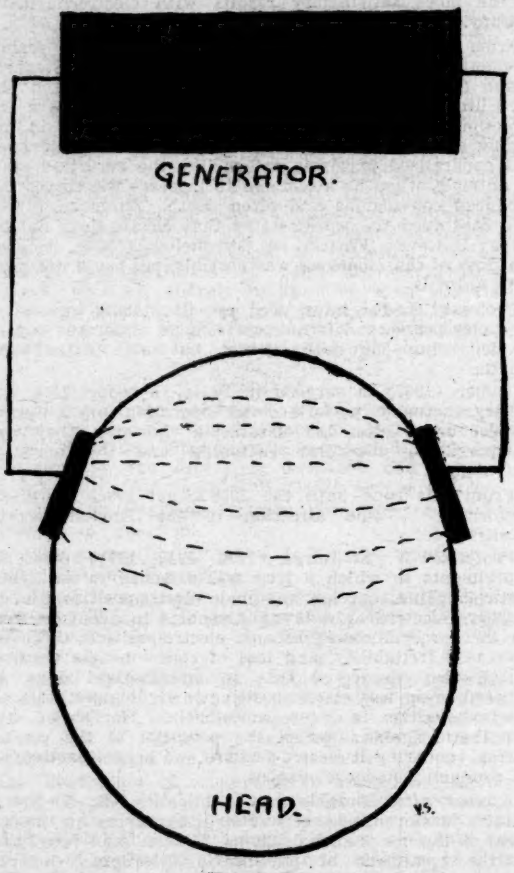

FIGURE I.

the permeability, thus polarizing nerve cells. (*c*) Cell permeability theory (Höber, 1907; Lillie, 1909; Loewe, 1913; Winterstein, 1913). This is merely an extension of the adsorption theory—adsorbed anæsthetics cause a change in the permeability of cells of the central nervous system. Permeability is decreased by anæsthetics, whereas stimulation of the nerve cells has the opposite effect. The mechanism is believed to be due to alteration in the state of the lipoids in cell membrane. (*d*) Colloid theory (Bernard, 1875; Bancroft and Richter, 1931). Cell colloids are aggregated during anæsthesia, and the process is reversible. (*e*) Inhibition of oxidation (Gerard, 1947; Butler, 1950; Quastel, 1952). Anæsthetic agents produce their effect by inhibiting cell enzyme systems, and so stop oxidation from taking place. (*f*) Electrical theory (Helliwell, 1950). This is only an observation that the cortex has decreased electrical potential during anæsthesia.

After review of all these theories, it would appear that anæsthesia may be due to one or more of the following: (i) depolarization of neuronal membranes; (ii) increased excitation threshold; (iii) increased rate and extent of accommodation; (iv) increased rate and degree of refractoriness; (v) increased membrane resistance; (vi) increased time constant of excitation; (vii) decreased amplitude of propagated impulses; (viii) suppression of repetitive firing of neurones; (ix) suppression of long-lasting facilitation; (x) decreased sensitivity to chemical mediators or facilitators.

What, then, does the electrical current do, and how may it be controlled to produce satisfactory anæsthesia?

When one considers the brain areas concerned with sleep, particularly the hypothalamus and reticular formation, it would seem that the earlier methods of application

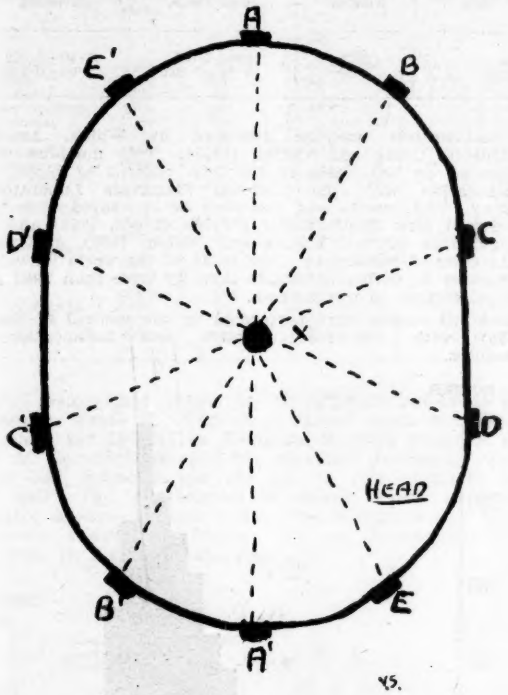

FIGURE II.

of current, usually by two electrodes, often fairly large, were very crude. The distribution of the electric current under these circumstances is fairly diffuse—almost a "shot gun" effect (Figure I).

Following a suggestion by H. Bratsbies, electro-physicist to the Mental Hygiene Department, Victoria, on the use of multiphasic oscillators with multiple electrodes, it would be possible to produce, say, five pairs of electrodes around the head, each pair with the wave form 36° ahead in phase with the previous pair, the net result being that the source of current appears to rotate around the head, giving minimum stimulation at the periphery and maximum at the centre point (X, Figure II).

By the use of a method such as this, fairly accurate localization of stimulation should be possible, and further investigation along these lines is indicated.

Electronarcosis of this type may prove of value in the treatment of psychiatric disorders. It is noticeable that most of the previous workers have rather limited themselves to one type of current, and particularly to a narrow range of frequencies; use of the higher frequencies up to radio frequency range (above 15,000 cycles per second) does not seem to have been tried at all.

The development of an anæsthetic without respiratory depressing drugs, and which could be turned on and off by means of a switch, would surely be a step in the forward direction.

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HÆMOGLOBIN VALUES OF NATIVES IN THE WESTERN HIGHLANDS, NEW GUINEA.

By R. J. WALSH,[1] HELEN COTTER[1] AND N. W. G. MACINTOSH,[2]

Expeditions to the Western Highlands of New Guinea in 1955 and in the summer of 1956-57 were organized by the Departments of Anatomy and Anthropology of the University of Sydney, in collaboration with the New South Wales Red Cross Blood Transfusion Service. They were supported by the Nuffield Foundation, and were undertaken to study certain medical and anthropological aspects of the native inhabitants. During the two expeditions, samples of venous blood were obtained from male native subjects and forwarded to Sydney by air. These samples were used primarily in an investigation of the blood group patterns in the area, the results of which have been published in a separate paper (Macintosh, Walsh and Kooptzoff, 1958).

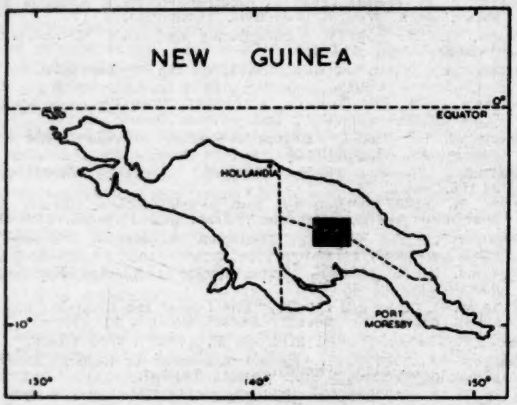

FIGURE I.
Map of New Guinea showing the Western Highlands region where the survey was undertaken.

At the time of collection, the blood was added to crystals of sodium citrate, penicillin and streptomycin to prevent coagulation and bacterial infection. It was therefore possible to measure the hæmoglobin and plasma protein values. The results of the hæmoglobin survey are reported in this paper; the plasma protein values are included in a comprehensive study of such values in various parts of the Pacific (Brading, 1958).

Materials and Methods.

Collection and Transport of Samples.

The collection and transport of blood samples has been described in detail elsewhere (Macintosh *et alii*, 1958). Briefly, about 5 ml. of venous blood was obtained from a cubital vein of each subject by one of the authors (N.W.G.M.) and Mr. Barry Lockett, of the Department of Anatomy, University of Sydney. The blood was mixed with crystals of sodium citrate and antibiotics in small vaccine vials. The vials were shaken to dissolve the crystals, and as soon as possible were sent by air to Sydney. The samples were not refrigerated in transit. The presence of the added salts in the blood causes shrinkage of the red cells and a corresponding increase in the volume of the plasma, so that the concentration of the plasma proteins is approximately 10% less than that found in plasma from blood mixed with heparin or oxalate salts. However, the hæmoglobin concentration is not altered, the red cell agglutinogens are well preserved (Kooptzoff, 1954) and the risk of bacterial contamination is minimized.

Technique of Testing.

Before blood was removed, the bottles were placed on a rotating machine (Dacie, 1956) for at least five minutes to produce uniform mixing of the red cells and plasma. A 1:200 dilution of the blood as oxyhæmoglobin was made by adding 50 c.mm. to a test tube containing 10 ml. of a 0·4% solution of ammonia. This dilution was made with accurately calibrated pipettes, and the hæmoglobin value determined on a photoelectric machine described by Walsh, Arnold, Lancaster, Coote and Cotter (1953). This machine was calibrated on the basis of the iron content of blood, in collaboration with the National Standards Laboratory, Sydney. The results can therefore be compared with the results in New South Wales (Walsh *et alii*, 1953) and in Bougainville (Cotter, Kariks and Walsh, 1958), and with the results of surveys in other parts of the world in which iron assay or carbon monoxide capacity have been used for the calibration of instruments.

TABLE I.
Hæmoglobin Values (Grammes per 100 ml.) of West Highland Natives.

Sex.	Number.	Mean Value.	Standard Deviation.
Male	2074	17·20±0·031	1·40±0·022
Female ..	30	15·19±0·193	1·06±0·136

Red cell counts were performed by the method of Dacie (1956) with calibrated pipettes and hæmocytometer chambers.

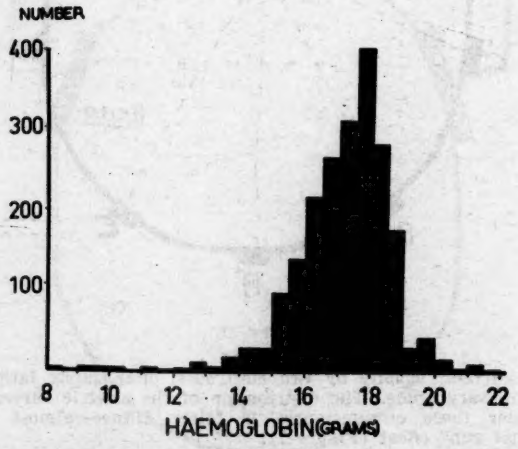

FIGURE II.
Distribution of the hæmoglobin values of 2074 adult male subjects.

Analysis of Results.

The subjects tested in the present survey were all resident in the Western Highlands region of the Australian Trusteeship Territory of Papua and New Guinea (Figure I). A total of 2074 samples from male subjects was tested, and samples were also obtained from 30 females. One of the authors (N.W.G.M.) was able to group the male subjects according to the sub-area of the district in which they were born. The sub-areas consist of basin-like depressions or river gorges, and the upper and lower limits of the inhabited parts may vary by 1000 feet, though usually by about 500 feet. The mean altitude for each sub-area is used in this paper, obtained from figures recorded with altimeters by members of the expeditions or noted in the reports of patrol officers or other local administration personnel.

[1] From the New South Wales Red Cross Blood Transfusion Service, Sydney.
[2] From the Department of Anatomy, University of Sydney.

Results.

The results obtained on the adult males and on the 30 adult females are shown in Table I. The mean values of 17·20 and 15·19 grammes per 100 ml. for males and females respectively can be compared with the mean values of 15·71 and 13·89 grammes per 100 ml. found in white Australians (Walsh *et alii*, 1952). The distribution of the values found amongst the male subjects in the New Guinea Highlands is seen in Figure II. The skewness of the curve is due to the number of subjects with values less than the mean.

TABLE II.

Hæmoglobin Values (Grammes per 100 ml.) in Different Sub-Areas of the Western Highlands.

Sub-Area.	Mean Altitude. (Feet).	Number.	Mean Value.	Standard Deviation.
Yugonda ..	8300	83	17·60±0·090	0·82±0·063
Chirunki ..	8250	116	17·83±0·082	0·88±0·058
Kundip ..	7700	61	18·16±0·147	1·15±0·104
Upper Ambum	7500	194	17·30±0·122	1·70±0·086
Tumundan ..	7500	62	17·78±0·135	1·06±0·095
Papayuk ..	7400	32	17·59±0·172	0·97±0·121
Muriraga ..	7400	106	18·36±0·109	1·12±0·077
Lalagam ..	7250	184	17·78±0·064	0·87±0·045
Lower Ambum	7050	230	17·31±0·073	1·10±0·052
Welya ..	6700	53	17·13±0·148	1·07±0·104
Western Upper Lai ..	6500	226	17·51±0·082	1·24±0·058
Tsak Valley	6000	59	17·05±0·147	1·13±0·104
Eastern Upper Lai ..	5800	184	17·15±0·073	0·99±0·051
Tari ..	5800	104	16·07±0·138	1·40±0·097
Mendi ..	5500	52	15·96±0·198	1·43±0·140
Wapanamanda	5500	78	16·64±0·133	1·18±0·094
Yaramanda ..	5400	65	16·69±0·122	0·98±0·086
Kompiam ..	4800	132	15·27±0·136	1·57±0·096

The hæmoglobin values in the different sub-areas are shown in Table II. The mean values range from 15·27 grammes per 100 ml. in Kompiam to 18·36 grammes per 100 ml. in Muriraga, and the standard deviations range from 0·82 grammes per 100 ml. to 1·70 grammes per 100 ml. The distribution of values found in three selected areas — Eastern Upper Lai, Kompiam and Muriraga—is shown in Figure III, to demonstrate the patterns in different sub-areas.

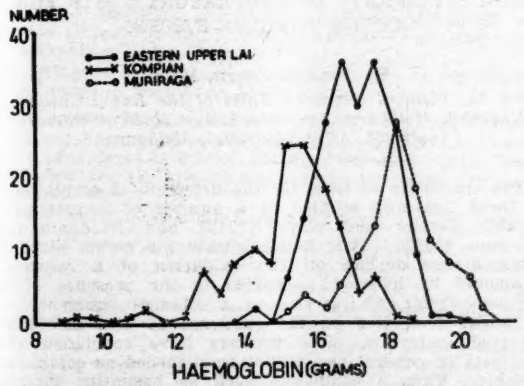

FIGURE III.

Frequency distribution of hæmoglobin values in adult male subjects in three sub-areas of the western Highlands.

It is apparent from Table II that there is a relationship between the mean values and the altitudes of the sub-areas, and this is more clearly seen in Figure IV. The line fitted to the values is also shown, and is expressed by the equation $x = 12{\cdot}89 + 0{\cdot}000641\,y$, where x is the hæmoglobin value in grammes and y the altitude in feet. The coefficient of correlation between the mean hæmoglobin values and the altitudes was +0·85.

Red cell counts were performed on 13 subjects. Mean values of $5{\cdot}87 \times 10^6$ red cells per cubic millimetre and of 18·02 grammes per 100 ml. of hæmoglobin were obtained. The mean corpuscular hæmoglobin value of 30·7 $\gamma\gamma$ is within the range reported for Australian blood donors by Lancaster and Banks (1957), indicating that the high hæmoglobin values are associated with an increase in the red cell concentration.

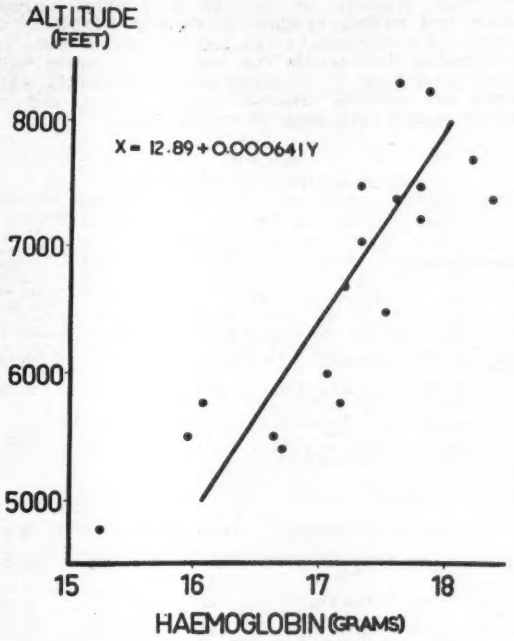

FIGURE IV.

The relationship between mean hæmoglobin value and altitude of residence (male subjects).

Discussion.

Hæmoglobin surveys of populations in the tropics usually disclose the presence of anæmia. For example, Cotter *et alii* (1958) recently reported that the mean hæmoglobin value of 691 adult male subjects in Bougainville was 13·09 grammes per 100 ml. The low values amongst populations in the tropics are variously ascribed to malaria, hookworm, nutritional deficiencies or combinations of these three factors. The high values found in the Western Highlands are therefore of interest. Malaria occurs in the areas, but the attack rate is low (Macintosh, unpublished observation), and hookworm ova counts on fæces from 12 subjects suggested that infestation was not of clinical significance (Backhouse, 1955). The dietary protein intake is low and almost entirely vegetable in nature, except at Mendi, where rats are plentiful and a favourite food. A clinical nutrition survey has not been conducted in the area, but kwashiorkor and other manifestations of protein malnutrition have been found in the adjacent Central Highlands region (Venkatachalam and Ivinskis, 1956), where the mean hæmoglobn value is also higher than that found in white Australians. The erythropoietic stimulus of high altitude must therefore overcome successfully any anæmia-producing effect of subclinical malnutrition and hookworm infestation, and of malaria when the attack rate is not high.

A number of investigations of hæmoglobin values at altitudes above 5000 feet are listed in Table III. The values are all increased at the high altitudes, but are somewhat variable between 5000 and 6000 feet. This variability is probably because the hæmoglobinometers used were not uniformly calibrated, but it may be the result of disease or nutritional deficiency. Inadequate

techniques may also explain the earlier belief that the hæmoglobin value is not increased at heights below 10,000 feet.

Altitude polycythæmia, with its corresponding increase in hæmoglobin and hæmatocrit values, has interested physiologists since it was first observed by Viault (1889). In the present paper, a line was fitted to the mean values found at different altitudes. However, the mean hæmoglobin values are more correctly related to the barometric pressure or to the atmospheric oxygen tension, and neither of these is linearly related to the altitude. An increase in the number of red cells and corresponding increase in the hæmoglobin concentration of the blood helps to overcome the tissue anoxia which follows the reduced alveolar oxygen tension and the reduced oxygen saturation of arterial blood.

TABLE III.

Some Hæmoglobin Surveys at High Altitudes.

Investigation.	Locality.	Altitude. (Feet.)	Number of Subjects.	Sex.	Mean Hæmoglobin Value. (Gm. per 100 Ml.)
Talbott and Dill (1936).	Quilucha.	17,500	6	M.	22·86
Hurtado, Merino and Delgado (1945).	Morococha (Peruvian Andes).	14,900	32	M.	20·76
Merino (1950).	Morococha.	14,900	7	M.	22·6
Barcroft, Benger, Bock, Doggart, Forbes, Aarrop, Meakins and Redfield (1923).	Cerro de Pasco (Peruvian Andes).	14,400	7	M.	22·6
Merino and Reynafarje (1949).	Cerro de Pasco.	14,400	16	M.	19·4
Hurtado, Merino and Delgado (1945).	Oroya (Peruvian Andes).	12,240	40	M.	18·82
Gil and Teran (1948).	Mexico City.	7500	100	M.	17·74
			100	F.	15·20
Ramalingaswami and Venkatachalam (1950).	Coonoor } Wellington } (India).	6200	80	M.	15·87
Stammers (1933).	Witwatersrand (South Africa).	6000	14	M.	14·8
Schepers (1947).	Witwatersrand.	6000	100	M.	20·40
			50	F.	18·30
Liknaitzky (1934).	Witwatersrand.	5800	60	M.	14·5
Symons (1939).	Witwatersrand.	5750	46	M.	15·0
Andresen and Mugrage (1936).	Denver (U.S.A.).	5000	40	M.	16·54

A reduction of the oxygen tension in the marrow tissue is believed to be the stimulus for the increased production of red cells; on the other hand, the homeostatic mechanisms which determine the mean values at particular altitudes are as little understood as those which determine the mean values of healthy populations at sea level. It is of interest, however, that the sex difference is of the same order at all altitudes.

Summary.

The mean hæmoglobin value of 2074 adult male natives resident in the Western Highlands of New Guinea was found to be 17·20 grammes per 100 ml. Analysis of the values in different sub-areas showed a positive correlation between altitude and mean hæmoglobin value. The altitudes ranged between 4800 feet and 8250 feet above sea level. A high mean value (15·19 grammes) was also found among 30 adult female natives living at an altitude of 7250 feet.

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THE SPECIFICITY OF LABORATORY TESTS FOR OCCULT BLOOD IN FÆCES.[1]

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The specificity of tests for the detection of occult blood in fæces has been studied by a number of investigators, notably Gettler and Kaye (1943) and Needham and Simpson (1952). All chemical tests for occult blood in common use depend on the oxidation of a colourless compound by hydrogen peroxide in the presence of an oxygen carrier, giving rise to a coloured substance. As a result of studies on the influence of diet and other ingested materials, most workers have concluded that the tests in general use cannot be regarded as completely reliable. Thus a compound such as hæmatin, entering the gastro-intestinal tract either as an excretion product of hæmoglobin (Forshaw and Mason, 1954) or from an active lesion, will give a positive reaction. The reaction is not specific, since chlorophyll and other food derivatives will also yield positive results.

The object of this investigation was to examine the specificity of the tests in common use, and to determine, if possible, whether such tests have any relationship to the loss of blood as shown by iron-balance studies.

[1] This paper was portion of the work submitted for the degree of master of science of the University of Melbourne.

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Methods.

The tests for occult blood used in this study were: (*a*) the saturated benzidine test (Harrison, 1947); (*b*) the 3% benzidine test (Forshaw and Mason, 1954); (*c*) the Gregersen test (as modified by Needham and Simpson, 1952); (*d*) the phenolphthalin test (Gettler and Kaye, 1943).

The technique of iron estimation was developed at the suggestion of Dr. Paul Fantl. A brief description of this method is given.

The following reagents are used: (*a*) N hydrochloric acid; (*b*) 90% thioglycollic acid; (*c*) 7N ammonia; (*d*) 0·5N hydrochloric acid; (*e*) standard iron solution (Hawk, Oser and Summerson, 1954), prepared as follows. Dissolve 0·702 gramme of ferrous ammonium sulphate in 100 ml. of water. Add 5 ml. of concentrated sulphuric acid. Warm slightly, and then add 5% potassium permanganate solution drop-by drop, till one drop produces a permanent colour. Transfer to a one-litre volumetric flask quantitatively, and dilute to one litre. One millilitre is equivalent to 0·1 mg. of ferric iron. This solution is stable indefinitely.

The procedure adopted is as follows. The subject is given a diet of fixed iron content for three days prior to the commencement of the test; then, while he is still taking this diet, three consecutive 24 hour specimens of fæces are collected. Each specimen is treated as follows:

1. It is blended with water to give a total volume of 700 ml.
2. Aliquots, each of 7 ml., representing 1% of the total fæces are pipetted into porcelain evaporating dishes, all tests being done in duplicate. To two further aliquots are added 30 µg. and 50 µg. of iron respectively.
3. The specimens are then dried at 100° C.
4. The aliquots are then ashed in a muffle furnace at 400° C. for 16 hours.
5. After the dishes have cooled, a small volume of water and a crystal of ammonium nitrate are added to each dish, the contents are again dried and then a second ashing at 400° C. for 16 hours is performed.
6. To the cooled samples 0·5 ml. of concentrated hydrochloric acid is then added, and the solution is allowed to stand overnight at room temperature. At this point a hydrochloric acid blank is included.
7. A small volume of water is now added, and the solution is evaporated to dryness.
8. The dry ash is quantitatively transferred with 0·5N hydrochloric acid to graduated centrifuge tubes, and the volume made up to 10 ml.
9. After insoluble material has been centrifuged off, suitable aliquots (1 ml. is usually adequate) are taken off for estimation.
10. With each estimation a standard curve is constructed over a range of from 10 to 70 µg. of iron.

The colour reaction is carried out as shown in Table I.

The colour intensities are read in a photoelectric colorimeter at a wave-length of 540 mµ. Standard curves obey Beer's law, and all experiments showed a recovery of between 100% and 110%.

The calculation is carried out as follows:

ingested iron − fæcal iron = iron absorbed.

Where blood is being lost into the gastro-intestinal tract this value is usually negative. From the iron content of hæmoglobin, as analytically determined, and the patient's blood hæmoglobin concentration, it is possible to estimate the loss of blood per day.

TABLE I.

Unknown.		Blank.	
Iron in—0·5N HCl	1·0 ml.	1·0N HCl	2·5 ml.
0·5N HCl	4·0 ml.	Water	2·5 ml.
90% thioglycollic acid	0·16 ml.	90% thioglycollic acid	0·16 ml.
7N ammonia	2·0 ml.	7N ammonia	2·0 ml.

Results.

First Stage.

In the initial part of the investigation, it was decided to determine the specificity of the various tests on the fæces of normal babies on a pure milk diet. Under such conditions it was anticipated that negative results would be obtained with all the tests employed. The saturated benzidine test and the Gregersen test were initially used, the children being fed on (*a*) fresh milk, (*b*) boiled milk or (*c*) "Lactogen" for the duration of the test. The results are shown in Tables II and III.

TABLE II.

Results of Examination of Fæces of Seven Healthy Babies on Milk Diet.

Subject Number.	Saturated Benzidine Test.	Gregersen Test.
1	(*a*) +	+
	(*b*) +	+
	(*c*) +	+
2	−	−
3	−	−
4	+	±
5	±	−
	−	−
6	±	−
	+	±
7	+	±

In view of the fact that weakly positive results were obtained from a number of the infants, as shown in Table II, raw milk, boiled milk and "Lactogen"—raw and boiled—were then directly investigated by these tests.

From Table III it is seen that both milk and "Lactogen" give positive results to the benzidine test, but that the material producing this result is destroyed by boiling for 20 minutes. It also appears that the Gregersen test is more specific than the saturated benzidine test, as it does not react to the factor in unboiled "Lactogen".

However, when boiled "Lactogen", giving a negative response to both tests, was fed to normal babies, posi-

TABLE III.

Results of Saturated Benzidine and Gregersen Tests on Milk Samples, Showing the Influence of Heating on the Saturated Benzidine Test.

Day.	Saturated Benzidine Test.						Gregersen Test.		
	Samples as Received from Diet Room.			Samples from Diet Room, Subjected to 100° C. for 20 Minutes.					
	Fresh.	Boiled.[1]	Lactogen.	Fresh.	Boiled.[2]	Lactogen.	Fresh.	Boiled.[2]	Lactogen.
1	+	+	+	±	±	−	±	−	−
2	+	+	±	±	−	−	+	−	−
3	+	+	+	−	−	−	+	−	−
4	+	+	+	−	−	−	+	−	−
5	+	+	+	−	−	−	+	−	−
6	+	+	±	−	−	−	+	−	−
7	+	±	±	−	−	−	+	−	−

[1] Boiled milk as supplied by the diet room; average time of boiling, five to 10 minutes.
[2] Sample as supplied by the diet room, boiled in the laboratory for 20 minutes.

tive results were obtained; this indicates a lack of specificity in both tests.

Further experiments showed that in order to render pasteurised cow's milk, received from the dairy, negative to the saturated benzidine test, a period of 40 minutes' boiling was required. It was also shown that when a normal infant fed on cow's milk gave a positive response

TABLE IV.

Comparison of Results of Saturated Benzidine, 3% Benzidine and Phenolphthalin Tests on Fæces from Hospital Patients on Unrestricted Diets.

Subject.	Saturated Benzidine Test.	3% Benzidine Test.	Phenolphthalin Test.
1. Man, aged 43 years; œdema.. ..	++	++	−
	++++	++++	−
	++	++	±
2. Woman, aged 66 years; diabetes, gangrene.	++	+	−
	++	+	−
	++	+	−
3. Man, aged 69 years; diabetes, cardio-vascular disease.	+	+	−
	+	−	−
	++	+	−
4. Man, aged 75 years; cardio-vascular disease.	++	+	±
	++	+	−
	++	+	−
5. Man, aged 68 years; diabetes, gangrene.	++	++	+
	++	−	−
	++	+	−
6. Man, aged 73 years; cardio-vascular disease.	++	++	+
	++	++	+
	++	−	−
7. Women, aged 75 years; diabetes ..	+	−	−
	+	−	−
	++	−	−
8. Man, aged 52 years; hypertension	++	−	−
	++	−	−
	++	−	−
9. Man, aged 40 years; cardiac neurosis	++++	++++	±

to the benzidine test, boiling the milk for 60 minutes failed to alter the reaction. This suggested the presence of another factor than that originally found in cow's milk.

It was then found that sodium hypochlorite in high dilution was used to clean the pipe lines in the dairy. Subsequent investigation showed that milk containing minute amounts of sodium hypochlorite gave a positive reaction with the benzidine test.

Second Stage.

The second stage of the investigation was performed on adult patients and the following tests were used: (*a*) the saturated benzidine test; (*b*) the 3% benzidine test; (*c*) the phenolphthalin test.

TABLE V.

Effect of Dietary Variations on "Occult Blood" in Fæces.

Subject.	Day.	Saturated Benzidine Test.	3% Benzidine Test.	Phenolphthalin Test.
A. ? Anæmia ..	1	++	−	−
	2	++	−	−
	3	Not done	−	−
	4	+++	±	−
	5	++	−	−
	6	+	−	−
B. ? Anæmia ..	1	+	−	−
	2	−	−	−
	3	−	−	−
C. (Subject 6, Table IV).	1	−	−	−
	2	−	−	−
	3	−	−	−

The patients considered were in hospital for conditions not involving the gastro-intestinal tract. They were all given a mixed normal diet for a period of three days prior to the collection of fæces and during the test.

Three 24-hour specimens were blended, and aliquots were heated at 100° C. for 10 minutes, cooled and tested. The results are shown in Table IV.

It is seen that when a normal mixed diet is being taken, the phenolphthalin test appears to be the most reliable. The 3% benzidine test gave inconsistent results, while the saturated benzidine test gave consistently positive results and hence was the most unreliable. In order to determine the factors in the diet which were producing the false positive results, three patients were investigated as follows: Patient A., diet free of red meat, milk (owing to findings in babies) and green vegetables; Patients B. and C., diet free of all meat, fish, milk and green vegetables. Patient C. (Subject 6, Table IV) had given positive results to all three tests on a mixed diet. The results are shown in Table V.

TABLE VI.

Comparison between Iron Balance and Occult Blood Test.

Subject.[1]	Mean Iron. (Milligrammes per 24 Hours.)		Occult Blood Test.		
	Intake.	Output.	Saturated Benzidine Test.	3% Benzidine Test.	Phenolphthalin Test.
2	13·2	7·1	++	+	−
			++	+	−
			++	+	−
3	13·0	10·8	+	+	−
			+	−	−
			++	+	−
4	12·3	13·3	++	+	±
			++	+	−
			++	+	−
5	12·3	5·3	++	++	+
			++	−	−
			++	+	−
6	12·0	8·6	++	++	+
			++	++	+
			++	−	−

[1] Reference numbers in Table IV.

It is apparent that under the conditions of total exclusion of meat, fish, milk and green vegetables the 3% benzidine test and phenolphthalin tests are quite reliable, and that the reliability of the saturated benzidine test is considerably improved.

An attempt was then made to correlate the presence or absence of positive results to "occult blood" tests with the iron-balance studies carried out as described previously. Seven subjects were investigated.

TABLE VII.

Comparison between Iron Balance and Occult Blood Tests in a Known Case of Gastric Ulcer.

Mean Iron. (Milligrammes per 24 Hours.)		Occult Blood Tests.		
Intake.	Output.	Saturated Benzidine Test.	3% Benzidine Test.	Phenolphthalin Test.
10·0	24·6	++	+	−
		++	+	−
		++	++	++

A patient with a suspected but radiologically doubtful peptic ulcer gave consistently positive results to occult blood tests. It was calculated that he was losing an average of 40 ml. of blood in every 24 hours. Later at laparotomy a hæmorrhaging lesion was found.

Five patients with no apparent gastro-intestinal lesions were placed on a 1900 Calorie diabetic diet, but with no restrictions as to type of food, for three days prior to and during the test, and a comparison between iron balance and occult blood in fæces was obtained. The results are shown in Table VI.

It is apparent that again the phenolphthalin test appears to give the closest correlation to the iron balance, the benzidine tests being quite unreliable under these conditions.

Lastly, a similar test was performed in a known case of gastric ulcer. The patient had been on an ulcer diet for some considerable time prior to this test, and it was continued during the test without further restriction. The result is shown in Table VII.

Thus it would appear that in the presence of slight gastric hæmorrhage the phenolphthalin test was possibly not sufficiently sensitive to detect minor quantities of blood on two of the three days of the test.

Discussion.

From a consideration of the results obtained, it is readily observed that chemical tests for occult blood in fæces are far from satisfactory. The tests based on benzidine appear to be far too sensitive and non-specific except under conditions of extreme dietary restriction, which must exclude all animal protein, green vegetables and milk. This criticism applies particularly to the saturated benzidine test, which has been found to give positive results even under these conditions. The phenolphthalin test appears to be far more reliable, but, as is seen in Table VII, may not be sufficiently sensitive to detect small amounts of blood, although one strong positive result was obtained in the series. It would appear that with any of these tests under normal conditions a considerable degree of reliance may be placed on a negative finding, but before hæmorrhage can be excluded a series of negatives is necessary (Table VII). A positive result is of little significance unless all animal protein, vegetables and milk are excluded for several days prior to and during the test.

The false positive results produced by the ingestion of cows' milk when fed to healthy young babies are of great importance, as milk is the basis of nearly all ulcer régimes. False positive results may indicate that an ulcer is still bleeding, whereas this is not so.

It would appear that, in cases of doubt, a better method is to perform an iron balance study. It is reasonable to assume that a well-marked negative iron balance is due to hæmoglobin entering the gastro-intestinal tract. However, this technique is too time-consuming for routine use, and under these conditions the phenolphthalin test carried out for several days with moderate dietary restriction seems to be the most reliable technique for clinical use.

Summary and Conclusions.

1. An investigation into the specificity of the tests commonly used for the detection of occult blood in fæces has been carried out.

2. These tests have been applied to normal babies on a milk diet, and to adults on normal mixed diets and restricted diets.

3. It has been found that milk frequently contains a factor producing false positive results.

4. Such tests are valid only when the results are negative, or when animal protein, green vegetables and milk are excluded from the diet.

5. The relation between iron balance and these tests has been studied.

Acknowledgements.

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THE LIMB-FITTING TEAM, ARTIFICIAL ARMS AND TECHNIQUES OF ABOVE-KNEE FITTING.[1]

By R. W. KLEIN,
Medical Officer, Repatriation Artificial Limb Factory, Victoria.

SINCE the last war, the outlook for the amputee has been greatly improved in Great Britain and the United States of America by the realization that in his rehabiltation two factors must be considered: first, the amputee's attitude to his handicap, and his ability to cooperate with those attempting to help him; and secondly, the ways and means devised to overcome his particular prosthetic problem.

It has long been recognized in these countries that standardization is unrealistic. The amputee requires the knowledge, skill, and judgement of what has become known as the limb-fitting team, and which comprises the medical officer, the prosthetic engineer, therapists, artisans and the amputee hismself. With the introduction of new plastic materials, another member versed in their application to prosthetics is highly desirable. Each amputee needs to be approached as an individual, and each member of the limb-fitting team must make his individual contribution to the total problem, so that a plan may be drawn up for the rehabilitation of the particular amputee.

In Great Britain, the United States of America and Western Germany, the standards and ethics of the limb-making profession are strictly controlled. Australia, however, has been lacking in any organized effort to improve techniques, and particularly to improve the standards. The necessity for close teamwork has also been neglected.

The United States of America and Australia have an additional problem—namely, how to serve the amputee population in isolated areas, particularly with regard to minor repairs and adjustments, and with the necessity for reviewing the amputee to ensure that he makes the best use of his prosthesis. In Australia, the problem is further increased as limb-making facilities are less, and are concentrated in the few densely populated cities.

In consideration of these failings, the Repatriation Commission, in 1945, established a Research Section under the direction of a senior research officer, who combined his engineering ability with outstanding ingenuity. The research officer, with the limb factory manager (a skilled artisan), were technical advisers to a committee concerned with artificial limbs. Consultant medical officers have always attended on a sessional basis. However, in 1956, the Commission requested that departmental medical officers should make a concentrated effort for improved cooperation with the artisans. By studying the principles of fitting, the medical officer becomes aware of the artisan's problems. The medical officer is now in a position to assist the prescribing surgeon and the artisan. By further study of the mechanical requirements and cooperation with the therapists, there is developing in this country a true team approach to the problem of amputee rehabilitation.

In a consideration of techniques, it should be realized that the prosthesis must be simple, and must function as near as possible to the part it replaces. It must be properly fitted and worn without discomfort. Furthermore, it must be light, strong, durable, economical and cosmetically acceptable. All these factors are closely inter-related, and naturally require the judgements of individual team members. An attractively finished prosthesis does not signify ideal function.

With artificial arms, the principal requirements are the ability to grasp to lift and to place the working prosthesis in any of the positions required for every-day activities. As weight bearing is not a problem, and

[1] Read at a meeting of the Section of Rehabilitation and Physical Medicine, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

as the principles of alignment are obvious, the fitting is usually made with a plaster cast. A male cast can then be covered with any of the multiplicity of moulding materials. Most commonly used is fibre glass and stockinet impregnated with polyester or epoxy resins. The problems then essentially become those of engineering ingenuity, and are concerned with the motivation of functional joints and terminal devices. Motivation may be by harness or by cineplasty. Activation of a terminal device by cineplasty has tremendous potential advantage, as the hook or hand can be used in any desired position, a condition not satisfied by harness. Biceps or pectoral cineplasty have, since 1947, been the two surgical procedures of choice.

Of the terminal devices, the hook is without question the most useful. For all persons except the labourer, the lyre-shaped hook is particularly efficient. The fingers are shaped like the tail of the lyre bird and are

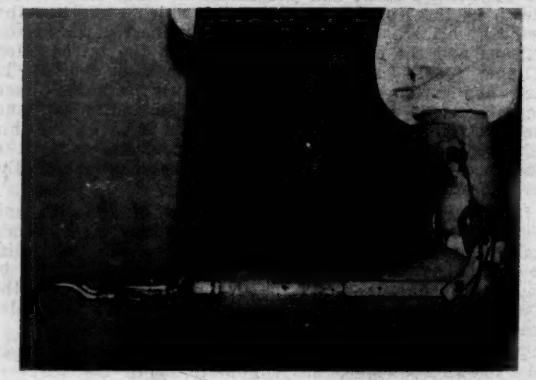

FIGURE I.

rubber lined. Small objects can be grasped by the points, while larger, and particularly round, objects are grasped by the proximal bulge. Hooks opened by muscle action against a spring are designated voluntary openers, and work in a manner directly opposed to the normal physiological action. The voluntary closing hook, which is closed by muscle force and opened by a spring, is, of course, desirable, but the delicate mechanism and consequent high cost is a slight disadvantage. However, in referring to price, I firmly believe that the loss of a limb cannot be estimated in terms of money.

Of the mechanical hands, the voluntary closing hand with a "chuck" grip between the thumb and first two fingers has a place, but its utility is limited. Its cosmetic effect is astounding, particularly when it is covered with the life-like plastic glove. Small units which allow wrist flexion have been developed, and the Repatriation Artificial Limb Factory (R.A.L.F.) in Victoria, manufactures a relatively cheap unit with good function. Working elbows, easily activated by harness to produce flexion and extension and locking in any desired position, are essential for the average, intelligent above-elbow amputee. External locking elbow hinges, and step-up units for rotation or flexion are all commercially available, and are requisites of any limb maker. With these appliances, all types of stumps, and even disarticulations, can be given a useful prosthesis.

Figure I illustrates an extremely intelligent and well-adjusted young man (an importer by occupation) using two voluntary closing hooks (with wrist-flexion units) motivated by biceps cineplasty. His buckets are kept short to preserve his supination and pronotion. Voluntary closing hooks were chosen because their action is comparable to normal physiological action. The excursion of the closing hook is in direct relationship to the contraction of the biceps, and the pressure of the pin on the remaining end organs gives the amputee a sense of the position of his hook.

Lower extremity amputation presents entirely different problems. A brief description of some of the techniques and requirements of above-knee fitting will demonstrate these. The techniques and requirements described apply irrespectively of whether the limb is suspended by body harness of by "suction". R.A.L.F., Victoria, manufactures the suction socket almost exclusively (95·5%). Arterial disease is not a contra-indication to the use of the suction socket, nor is age or length of the stump.

The first requirement is the measurement and appraisal of the stump and, of course, of the amputee himself. Such measurements as the length of the stump, the circumferences at different levels, the amount of flexion and abduction (unfortunately unnecessarily common deformities), and the distance from the adductor tendon to the ischial tuberosity will be recorded. Consideration will be given to the amputee's general musculature and coordination, which will help to decide the type of knee joint to be used. These knee joints are broadly designated according to their actions as constant friction (a constant brake action), variable (giving deceleration), friction lock (locking on weight bearing) and polycentric (movement of the axis somewhat like the normal knee). Different amputees will require different joints and/or combinations.

No one type of prosthesis will serve all amputees, although it is considered that a good variable friction knee might satisfy most. In the sculpturing of the bucket from a solid willow block, two methods are

FIGURE II.

advocated and practised as a guide. In the first method, a plaster cast is taken. However, a female plaster cast does not satisfy the anatomical and biomechanical requirements. To prepare a bucket for a rough fit by this method, plaster build-up, callipers and a skilled eye are necessary. This method is almost universally used in Germany, and requires considerable skill and practice. In the second method, the shape of the inlet may be roughly designated with a template. The wooden block is then carved slightly undersized with a "pulling" tool, the anatomical and biomechanical requirements being taken into consideration. By removal of excess wood, the bucket is carefully fitted to the individual stump. I know of no proven method which supersedes the latter, especially when used in conjunction with the University of California's quadrilateral template.

In fitting the above-knee amputee, the principal weight-bearing area should be the gluteal region and the ischial

tuberosity in particular, as with normal sitting. To avoid the older "plug" type of fitting, which forced the tissue upwards and caused fibrous rolls to develop above the bucket, and which tended to force the femur through the tissue of the end of the stump, it is necessary to support the amputee by his ischial tuberosity. This is accomplished by his tuberosity being held half an inch back on the posterior wall of the bucket. If he is not so held, he "falls into" his bucket, which causes constriction of his tissues in the funnel and pressure on the vital structures in Scarpa's' triangle. His ischial tuberosity is preferably placed sufficiently laterally to allow the ramus of the ischium to fall inside the medial wall of the bucket. Any weight bearing on the ramus is extremely painful. However, if the patient is supported by his ischial tuberosity, the ramus cannot contact the brim

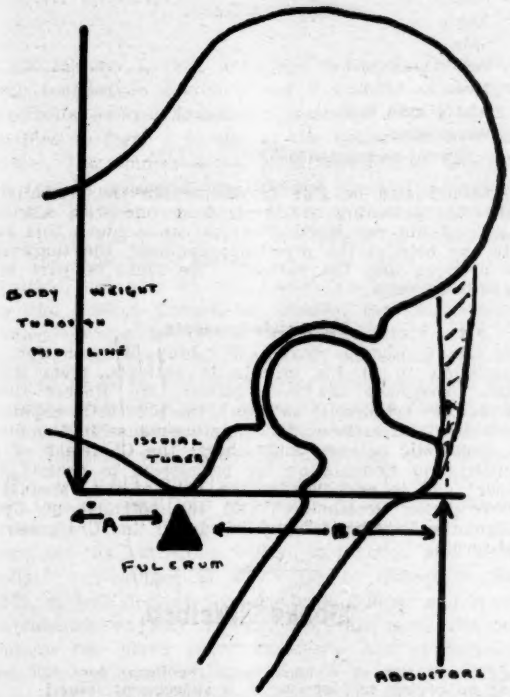

FIGURE III.

of the bucket. A lowering of the wall in an attempt to avoid this pressure merely causes a fibrous roll to develop, which in turn develops inclusion cysts from chafing. The posterior supporting brim is the amputee's "seat", and should be parallel with the floor on weight bearing. The need for this is obvious to anyone who has sat on a so-called contemporary chair with a sloping seat. The amputee is kept back onto his seat by the antero-posterior diameter of the medial part of the bucket being kept half an inch less than the distance from the ischial tuberosity to the adductor tendons, and by a high anterior wall. This anterior wall is too high only if it strikes the anterior superior spine when the patient sits. It is usually two inches to three inches higher than the posterior brim (Figure II).

Figure III refers to alignment. As the amputee is essentially supported by his ischial tuberosity and as his effective body weight passes down through the vertebral column, then the ischial tuberosity area on the brim of the bucket acts as a fulcrum to a lever arm represented by the pelvis. The counter force (to the body weight) is supplied by the abductors acting between the outer side of the pelvis and the femur, which is stabilized in the bucket. As muscles function most efficiently at the normal rest length, in order to get the most force from the abductors and so stabilize the lever arm of the pelvis, it is necessary to adduct the stump so that the angle between the pelvis and the femur is as nearly as possible the same as that in the normal limb. This prevents the "pelvic dip" so often seen in above-knee amputees, and eases the tension on the adductors. In practice, this is obtained by the

FIGURE IV.

medial wall of the bucket being made vertical when it is shaped, and by careful fitting of the lateral wall with an inward slope to produce adduction and stabilization of the femur. Because the amputee has almost unlimited flexion, but has lost all his extensors except the gluteals, some flexion is also necessary, depending on

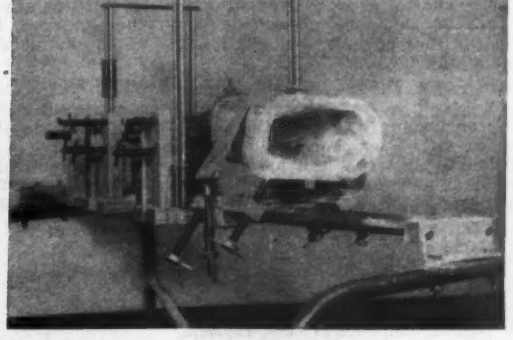

FIGURE V.

the length of the stump. As the ischial tuberosity area is essentially the weight-bearing line, and since a gait with minimal distance between the heels is the least energy-consuming and the most cosmetically desirable, then the direct vertical line down the ischial tuberosity (Figure IV) is the position of reference for placing of the foot. Stabilization and length of the femur and

the amputee's activity influence this. The foot may then be either directly under, medial to (as with a long stump in an active amputee) or just lateral to the ischial tuberosity. The more medial the foot is placed, the nearer the mid line is to the real point of the fulcrum (Figure III) under the lever arm of the pelvis. This, in effect, increases the length of the lateral arm. Consequently, the effective force of the abductors is increased, giving greater stabilization of the pelvis. After individual fitting, the bucket is screwed to the so-called "skeleton leg" (Figure IV), with the above-mentioned requirements borne in mind, and the patient walks under a therapist's supervision. The medial wall of the bucket will be vertical for the average amputee (without abduction deformity), and the foot will be directly under the ischial tuberosity. The greater trochanter, centre of knee and ankle will be in a vertical line when viewed

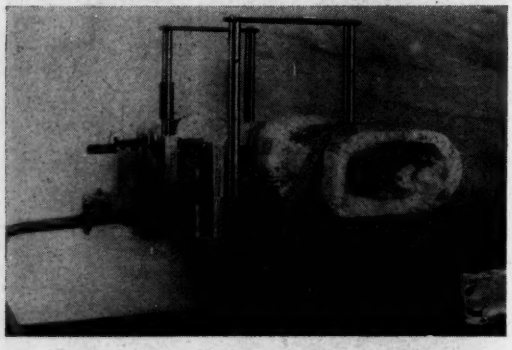

FIGURE VI.

laterally, as with the normal limb (Figure IV). The knee may be placed behind this line for added stability. This appliance allows minor adjustments to be made. Height, flexion, extension, varus, valgus, rotation, abduction and adduction are adjustable. When the amputee, after these minor adjustments, is walking as nearly to perfect as was originally planned, according to his local and general condition, the entire set-up is transferred to an aligning jig (Figure V). After the jig is set, the skeleton leg is removed, leaving the bucket. The prosthesis is then built to the bucket in this jig (Figure VI), with the assurance that the alignment is the same as that arrived at during the trial walk. As may be imagined, to build up a prosthesis to the bucket in this jig necessitates a considerable amount of manipulation. Because of the ease of cutting and glueing, wood is, to date, the obvious material with which to obtain ideal alignment.

Conclusion.

In conclusion, I should like to suggest that it is the duty of all of us concerned with amputees to be in a position to prescribe the prosthetic requirements for the individual amputee. The following prescription form for prostheses could be used (Klopsteg and Wilson, 1954).

Name Date

Address Age Sex Race

Level of amputation.....

Date of amputation (last revision).....

Complications (drainage, delayed healing, etc.).....

Stump condition

Flabby or firm.....

Scars .....

Pain .....

Joints—weakness .....

Limited motion.....

Other disabilities.....

ARM	*Right*	*Left*
Terminal device, hook	.....	.....
Terminal device, hand	.....	.....
Wrist-flexion unit	.....	.....
Disconnect and/or rotation device	.....	.....
Forearm section	.....	.....
Elbow	.....	.....
Upper-arm section	.....	.....
Harness suspension	.....	.....
Control (including cineplasty)	.....	.....
Suggested harness pattern	.....	.....
Special recommendations		

LEG	*Right*	*Left*
Foot	.....	.....
Ankle	.....	.....
Shin	.....	.....
Below-knee socket	.....	.....
Knee	.....	.....
Above-knee socket	.....	.....
Suspension	.....	.....
Special recommendations	.....	.....

We should also be able to distinguish the well-aligned and well-functioning prosthesis from one with a glossy finish. I am convinced that we can achieve this only with the help of the prosthetic engineer, the therapists, the artisans and the patient. We must be part of a limb-fitting team.

Acknowledgements.

I should like to thank Mr. John Hueston for his permission to fit his cineplastic patients, from whom much experience has been gained; Mr. Robert Hodge (consultant orthopædic surgeon), the prosthetic engineers, therapists and artisans for their assistance in the fitting of cineplastic patients and others; the Chairman of the Repatriation Commission for permission to present this paper; and to acknowledge the help of the "Manual of Above Knee Prosthetics" and the "Manual of Upper Extremity Prosthetics" published by the University of California.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Physical Diagnosis: The History and Examination of the Patient", by John A. Prior, M.D. and Jack S. Silberstein, M.D.; 1959. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Limited. 9¾" × 6¾", pp. 388, with 193 illustrations. Price: £4 2s. 6d.

A book for students.

"Pediatric Clinics of North America", Volume 6, Number 1; 1959. Philadelphia & London: W. B. Saunders Company; Melbourne: W. Ramsay (Surgical) Limited. 9" × 5¾", pp. 336, with illustrations. Price (annual subscription): £6 15s.

Contains a symposium on fluid and electrolyte problems, covering physiological considerations, clinical applications and technical procedures. The consulting editor is Lewis A. Barness, M.D.

"Wolff's Diseases of the Eye", revised by Redmond J. H. Smith, D.O. (Eng.), M.S. (Lond.), F.R.C.S. (Eng.); Fifth edition; 1959. London: Cassell and Company Limited. 9¾" × 7", pp. 238, with 150 illustrations. Price: 42s. (English).

This book for students and non-specialist practitioners first appeared in 1937. The original author has died since the publication of the previous edition.

"The Year Book of Drug Therapy (1958-1959 Year Book Series)", edited by Harry Beckman, M.D.; 1959. Chicago: The Year Book Publishers; Melbourne: W. Ramsay (Surgical) Limited. 7¼" × 5", pp. 276, with illustrations. Price: 32s. 6d.

One of the Practical Medicine Series of Year Books.

The Medical Journal of Australia

SATURDAY, JUNE 20, 1959.

THE AUSTRALIAN COLLEGE OF GENERAL PRACTITIONERS.

ON January 1, 1953, a College of General Practitioners was founded in England, and a number of doctors in Australia became foundation members. In 1953 it was decided to form a faculty of the College in New South Wales, and similar action soon followed in Queensland. In 1955 at a meeting in Brisbane an Australian Council of the College was formed to coordinate its various activities, and subsequently faculties were established in all the Australian States. At the same time it was realized, not only by the Australian members, but also by the College Council in London, that an Australian College would be formed at some future date. To prepare for this eventuality, and to enable the future College to be in a position to acquire a property for its headquarters, steps were taken to form a company to be known as The Australian College of General Practitioners. This company was registered in Sydney on February 4, 1958. A large majority of members in Australia then felt that, as conditions of practice were very different in Australia from those in Great Britain, the time had come for the Australian College to function as a separate body. Accordingly, at a meeting in Hobart in March, 1958, it was decided that the new College should begin to function on July 1, 1958. In this move the parent College has given every assistance and encouragement and has allowed all the assets of the Faculties in Australia to be transferred to the Australian College.

The College is an academic body, which is composed of active general practitioners or former general practitioners. It is the only organization which is conducted entirely by general practitioners, and it aims to maintain the highest standards in general practice. In a wider field it looks to the British Medical Association to care for the interest and well-being of all medical practitioners and to unite them in a common bond. It maintains a close link with the universities and medical schools throughout Australia. It makes provision for post-graduate training of general practitioners. It aims to assist in the training of medical students and recent graduates in the conduct of medical practice, something that can be learnt only by close association with the family doctor in his daily work as he moves amongst the sick in their homes. It aims to carry out research work in general practice, an aim with great scope and future, as there is a vast amount of knowledge and clinical material which, if collected by a central body, could materially assist in clarifying various aspects of disease in the community. It should never be forgotten that the proper recognition of heart disease was the result of the work of James Mackenzie, a general practitioner, and that Edward Jenner, also a general practitioner, was responsible for vaccination against smallpox. The College acts in cooperation with the Federal and State Governments in the prevention of disease. It has a representative as a member of the National Health and Medical Research Council, a Federal Government body. It has arranged through this Council for a member of the College to make a survey of the types and conditions of general practice in Australia. It has aroused the interest of many of the drug firms, which have given financial assistance to help conduct courses of study and provide lecturers, and one firm has given a substantial sum of money for an overseas travelling scholarship; no doubt other firms will do the same.

Membership of the College is open to a general practitioner who has been qualified for seven years and has been in general practice for at least five years; he must agree to continue post-graduate study while he remains in active practice. Associate membership is open to all medical practitioners who are not eligible to become full members. Many specialists have become associate members to assist in the work of the College. The President of the College, on his election, becomes a Fellow. Three members of the British College have been elected the first Honorary Fellows in recognition of their position in that College and of the services they have rendered. They are Dr. William Pickles, the first President, Dr. John Hunt, the Honorary Secretary, and Dr. Ian Grant, the present President. Permanent headquarters for the College are a future need. At present a committee is working to find suitable premises and arrange for the finance to purchase them. This is an opportunity for citizens or companies to assist in a new and worthwhile venture.

The College is interested in both under-graduate and post-graduate education. Medical students are attached to approved general practitioners to gain a degree of training and insight into general practice. In New South Wales fifth-year students visit country hospitals in vacation time, are given free board and residence in the hospitals and learn something of general practice in the country. Lectures are given in some of the medical schools on preventive medicine and on various aspects of disease as met in general practice. In the field of post-graduate education each faculty has its own committee which arranges lectures and courses of interest to the general practitioner. The College members are also urged to support other organizations such as the university post-graduate committees and the British Medical Association. In New South Wales the College has an arrangement with the Royal Newcastle Hospital for six senior resident medical officers each to spend two months with a member of the College—in the first month to be taught how to conduct a general practice, in the second month to stay on in the practice as a *locum tenens*. In other States arrangements are made for the general practitioner to have access to hospitals for refresher study. The College is also planning to have hospitals available in each State, so that their members can be brought up to date in all branches of medicine, such as anæsthetics, midwifery, children's diseases, surgery, dermatology, orthopædics, etc. The view of the College is that such hospitals should not be teaching

hospitals. In New South Wales the Royal Newcastle Hospital is prepared to accept members of the College for this purpose.

Of considerable importance is the interest of the College in research. Research committees function in each State Faculty, and members of the College are encouraged to take part in clinical research, either as members of a team on some project—e.g. penicillin sensitivity (a report on which appears on page 827), infectious hepatitis, eclampsia—or as individuals on projects of special interest to the particular members. The College is also cooperating with the Federal and State Government health authorities on preventive medicine. A significant project is a survey of general practice being made by Dr. C. C. Jungfer of South Australia; his expenses and salary are being paid by the Federal Government. The College has official representation on many other bodies, and its members, although not as such, are to be found on the Federal Council and on the several Branch Councils of the British Medical Association; four are presidents of their Branches. Another member, Dr. L. Mallen, is Chairman of the Council of the World Medical Association. The publications of the College include *Annals of General Practice* and pamphlets on aids to modern therapy.

The first annual meeting of the College was held in the Great Hall of the University of Sydney on March 20, 1959. Elsewhere in this issue we publish an account of the meeting (see page 851) and also the address (see page 825) given by Dr. Ian Grant, President of the parent College, who visited Australia for the occasion. It was a great occasion for the young College. Like all newcomers, especially to such a conservative field as medicine, it has been expected to prove itself before being fully accepted. This it may be said to have done, and we look forward to seeing it make the unique contribution that it is fitted to make to the high tradition of Australian medicine.

Current Comment.

THE HAZARDOUS HULA-HOOP.

ONE of Australia's most recent contributions to civilization has been the cult of the hula-hoop, which has swept through a number of countries in epidemic fashion, affecting not only the very young, but surprisingly, the not so young. The members of the former group generally possess an agility which enables them to perform the necessary gyrations without harm. The matter is not so simple for those intrepid souls in the second group who undertake this form of exercise while out of condition. Warnings have already been given in the lay Press that this procedure is inadvisable. Now comes a cautionary tale from as far away as France.

J. Vernhet, from Montpellier,[1] reports the case of a young woman, aged 34 years, who tried her hips at hula-hooping one evening, after having during the day carried on her usual occupation of heavy farm work. She was in excellent physical condition, and her abdominal musculature was particularly strong. (This fact was confirmed later, at operation.) After a few minutes of her new activity she suddenly felt a sharp, stabbing pain in the periumbilical region, so severe that she doubled up. However, she contented herself with going to bed by way of treatment. At three o'clock on the following morning she was admitted urgently to hospital with the diagnosis of an acute abdominal emergency; at that time she was lying curled up on her right side, in a state of shock and covered with cold sweat, and pain was interfering with her respirations. She had vomited several times, her pulse rate was 100 per minute and her temperature was normal. Examination revealed, with accompanying abnormalities, a mass the size of a fist on the right side of the abdomen, just below the umbilicus. Conservative treatment was undertaken, and six hours later her general condition had improved. However, the tumour had increased in size to that of the head of a new-born baby, and because of the accompanying indications operation was undertaken. The actual injury found was a complete rupture of the right rectus muscle, the lower portion of which had retracted towards its pubic insertion. All attempts at approximating the two ends of the muscle were unsuccessful, so all that could be done was to remove the extensive blood clots, effect hæmostasis and establish drainage. During the 48 hours after the operation 150 ml. of blood-stained fluid drained away, and the drain was removed on the third day. The patient left hospital, in excellent condition, ten days after the operation.

Vernhet comments on the rarity of rupture of the right rectus muscle, especially in the absence of a blow or other external injury. He points out that this muscle is capable of withstanding quite forceful traction, and that rupture of a healthy rectus muscle does not seem possible unless the direction and amplitude of movements are entirely unphysiological. He prophesies that: "In view of the enthusiasm aroused by this hoop at the present time and the frenzy with which it is used, it is certain that accidents like this are likely to increase in number among adults out of training." Let us hope that, in this respect at least, adults may learn not to behave like children.

[1] *Presse méd.*, 1959, 67: 563 (March 21).

DDT.

DICHLORO-DIPHENYL-TRICHLORO-ETHANE, more commonly known as DDT, dicophane (B.P.) or chlorophenothane, is a poison which is so widely employed that exposure to it in some degree may be regarded as almost universal in westernized society. It is therefore natural that people should speculate from time to time as to whether it is really as harmless to man as it is made out to be. It is generally supposed that its lack of toxicity to man is accounted for by the fact that it is not easily absorbed by him, being virtually insoluble in aqueous media. Most cases of poisoning reported in man refer to instances where the victim has swallowed, or been in close contact with, a solution of DDT in kerosene or some similar solvent, and it is supposed by some workers that the toxic effects are more those of the solvent than of the DDT.[1] However, such cases of poisoning are very exceptional, and it is well known that large numbers of people employed in the manufacture and application of DDT expose themselves freely to it in both the powdered and dissolved forms without apparent ill effect.

In America, public health workers have published a number of papers about the effects of DDT both on those with a history of intensive exposure to it and on the general population. In a paper published over two years ago, W. J. Hayes, jnr., and colleagues[2] described an experiment in which human volunteers were given DDT in milk at varying dosage rates over a prolonged period, and found that no adverse effects were experienced at intakes of up to 35 mg. per man per day. It was known that in man DDT is stored in body fat, and it was found that the amount stored reached equilibrium within twelve months, and that the level of storage corresponded to dosage. In a recent paper Hayes and his co-workers[3]

[1] "The Extra Pharmacopœia", Martindale, twenty-third edition; p. 480.
[2] *J. Amer. med. Ass.*, 1956, 162: 890 (October 27).
[3] *A.M.A. Arch. industr. Health*, 1958, 18: 398 (November).

report the results of an investigation into the storage of DDT and DDE (a metabolite of DDT) in individuals from the general population and in persons with occupational exposure to DDT. They analysed the content of DDT and DDE in samples of fat tissue from 227 individuals during the period 1954 to 1956. The samples were obtained in the course of surgical procedures undertaken for other purposes, and were compared with samples of fat tissue from autopsy material obtained before the advent of DDT. They found that there had apparently been no progression in the storage of DDT in the general population of the United States since this storage was first measured in 1950. Persons who abstained from meat deposited in their fat only about half the concentration of DDT found in the general population (2·3 p.p.m. as compared with 4·9 p.p.m.). Hayes and his colleagues conclude that virtually all DDT and DDE stored in persons without occupational exposure is derived from their diet, and principally from fats of animal origin. Persons with occupational exposure to DDT were found to store more DDT-derived material than other people, and the amount stored was generally proportional to the intensity and frequency of exposure.

In another paper, M. O. Ortelee[1] reports a study of the effect of prolonged intensive occupational exposure to DDT in a group of 40 men employed in the manufacture of DDT or in making up preparations containing DDT. Estimates of DDT absorption in these men were made by comparing the concentration of DDA (another metabolic derivative of DDT) in their urine with that found in volunteers taking a known daily oral dosage of DDT. Good correlation was found between an empirical estimation of the intensity of exposure to DDT and the levels of urinary DDT obtained, but there was no correlation between the intensity of exposure and any significant pathological condition or any hæmatological or serological abnormality. The author concludes that there is no evidence of any illness or symptom-complex identifiable as chronic DDT poisoning among men exposed, for periods up to 6·5 years, in such a way that they absorbed about 200 times as much DDT as is absorbed by the general population from their diet; he therefore considers that, with the possible exception of rare hypersensitivity reactions, it is unlikely that any such condition exists among the general population as a result of the present level of DDT intake from a normal diet.

NUCLEAR SEX.

THE discovery by Barr and Bertram of the sex chromatin in female cells belongs to the realm of serendipity. Briefly, during the observation of changes in the neurons after stimulation of the hypoglossal nerve in the cat, it was noticed that a small intranuclear mass which altered its position on stimulation was not present in the nerve cells of male animals. This discovery has had such far-reaching effects that a symposium was held in 1957 in order to bring together all fields with interests related to nuclear sexing. Accordingly, representatives of many disciplines ranging from anatomy to psychology were invited to participate. The papers have now been published.[2] Professor Murray L. Barr himself gives a short historical introduction. The ensuing papers can then be divided into three groups. The first section comprises papers dealing with cytological and genetical studies related to nuclear sex. The second section, which is the one most likely to appeal to the great body of clinicians, is concerned with intersex and related states. The third section is concerned with tumours.

Leo Sachs and Mathilde Danon introduce the second section with a discussion of those cases of intersexuality in which the gonads have undergone a differentiation contrasting with the sex chromosome constitution or are altogether absent, as in Klinefelter's syndrome, gonadal agenesis and the "testicular feminization" syndrome. Professor C. Overzier elaborates upon this theme, suggesting that the type of intersex depends upon the stage in fœtal life at which gonadal damage occurs. For example, imperfect gonadal development in a genetic male could be expected to produce the feminization seen in Turner's syndrome.

It is suggested in several papers that anomalies of sex characterization are not the result of pure chance, but may themselves be genetically determined, and this opinion is reinforced by several interesting papers on Klinefelter's syndrome. To the clinician Klinefelter's syndrome is infertility in a male with small testes. To the geneticist there is both true and false Klinefelter's syndrome, the former having the female sex chromatin pattern and the latter having the male pattern. The histologist, as Bernard Lennox points out, can separate the two groups on the basis of testicular biopsy. There would thus appear to be two types of Klinefelter's syndrome—one with hyalinization of seminiferous tubules, clumped masses of Leydig cells and a chromatin-positive nuclear sex pattern, and the other in a group of genetic males with various types of testicular atrophy. An interesting paper by J. S. S. Stewart and other members of the Glasgow group supplies evidence that the chromatin-positive variety of Klinefelter's syndrome is due to a genetic factor transmitted through the father, while the mother is responsible for the manifestation of the chromatin-negative or false Klinefelter's syndrome. Klinefelter's syndrome must be more common than one would suppose, there being an estimated incidence in Glasgow of one chromatin-positive example in every 18,000 males and one chromatin-negative in every 14,000 males. Incidentally, the paper of W. M. Davidson and D. Robertson and also that of Professor H. R. Weidermann make it clear that examinations of buccal smears or skin biopsies are more reliable than neutrophil leucocyte examinations for determining the genetic sex, especially in Klinefelter's syndrome. There are other interesting papers in this section dealing with such subjects as transvestism and homosexuality, though in neither of these conditions could any significant genetic factor be traced.

The third part of the symposium deals with tumours. It is apparent that the chromatin pattern of teratomas in males may be male, female or a mosaic of each. This fact, together with the fact that in females it is always of the female pattern, suggests that the discarded theory of their origin by parthenogenesis may have to be revived.

It appears that, as yet, the applications of nuclear sexing are the obvious ones. However, it can be fairly confidently predicted that as we learn more, various other enzymatic and morphological questions will be answered.

AN HONOUR FOR DR. R. J. WALSH.

DR. R. J. WALSH, Director of the New South Wales Red Cross Blood Transfusion Service, was elected a Fellow of the Australian Academy of Science on May 6, 1959. Dr. Walsh is well known to medical practitioners in Sydney and throughout N.S.W. for the excellence of the service provided by the N.S.W. Red Cross Blood Transfusion Service, but it may not be so widely known amongst the medical profession that he has an international reputation as a blood group immunologist and as a physiologist working on the hæmatopoietic system. It is in the latter capacity that Dr. Walsh was elected a Fellow of the Australian Academy of Science. Dr. Walsh is the only medical Fellow of the Academy resident in Sydney at present, although Dr. M. R. Lemberg and Professor C. W. Emmens are Fellows working in the basic medical sciences.

[1] *A.M.A. Arch. industr. Hlth*, 1958, 18: 433 (November).

[2] "Symposium on Nuclear Sex", edited for the Organizing Committee by the Secretary, D. Robertson Smith, M.A., M.D., and William M. Davidson, M.D., foreword by Professor Robert Platt, M.D.; 1958. London: William Heinemann (Medical Books), Limited. 8¼" × 5¼", pp. 208, with many illustrations. Price: 21s. (English).

Abstracts from Medical Literature.

OPHTHALMOLOGY.

Cataracts in Galactosæmia.

W. A. WILSON AND G. N. DONNELL (*A.M.A. Arch. Ophthal.*, August, 1958) draw attention to the ocular manifestations of galactosæmia. Infants with galactosæmia are normal at birth, but signs and symptoms appear within a few days or weeks. These symptoms are usually vomiting, lethargy, fever, or failure to gain weight. Icterus, ascites, œdema, hepatomegaly and splenomegaly are among the physical findings. The presence of cataracts and mental retardation may be recognized as early as the age of four to eight weeks. A reducing substance in the urine and albuminuria are often present. Galactose tolerance tests may be necessary to establish the diagnosis. The disease is an inborn error of galactose metabolism resulting from deficiency of a specific enzyme necessary for its utilization. It is known to be an hereditary disease, but the exact mode of transmission of the gene is not known. The exact mechanism by which tissues are damaged is not known, but it is thought that the accumulation of galactose-1-phosphate has a direct toxic effect on liver, spleen, brain and the crystalline lens. The authors report 12 cases, and note that treatment does not necessarily cause regression of cataracts.

The Goldmann Applanation Tonometer.

R. A. MOSES (*Amer. J. Ophthal.*, December, 1958) describes the use of the Goldmann applanation tonometer. Errors in measurement may be due to lids touching the prism, lashes being caught between the prism and the cornea, improper surface tension anæsthesia, improper cleaning of the tonometer, improper adjustment of height, prolonged contact between the cornea and the prism and improper placement of the light beam. Any condition which thickens the cornea or alters its characteristics gives unreliable results. The most important advantage of this tonometer is that the estimates of intraocular pressure are unaffected by scleral rigidity. It cannot be used readily on recumbent patients.

The Differential Diagnosis of Papillitis and Papilloedema.

M. CHAMLIN (*A.M.A. Arch. Ophthal.*, January, 1959) reviews the points which serve to differentiate papilloedema from papillitis. In optic neuritis the pain is behind the eye, and increases with movement of or pressure on the globe. It precedes or accompanies the visual disturbance. In papilloedema there is usually generalized headache, which precedes the appearance of the papilloedema and is not related to ocular movement. In optic neuritis there is sudden and rapid loss of vision, while in papilloedema visual loss is transient and slow. The fundus appearance in these two conditions is not always sufficiently characteristic to be entirely reliable in the making of a differential diagnosis. Papillitis is more frequently unilateral, papilloedema is practically always bilateral. The author records a differential sign, namely the finding of aqueous floaters in cases of papillitis, and he reports four cases to support this sign.

A Method of Iris Inclusion.

D. PIERSE (*Trans. ophthal. Soc. U.K.*, 1958) describes his technique of iris inclusion. He uses the technique in all cases of early closed angle and moderate open angle glaucoma. The iris forceps are introduced into the anterior chamber through an *ab externo* incision tangentially instead of towards the pupil. The iris is grasped and withdrawn into the incision by tearing it at its root. The tongue of the iris is incised by a single lateral cut. The iridectomy is truly basal, and the iridectomy is away from the site of the incision and the iris inclusion.

The Priscol Test in Glaucoma.

J. PRIMROSE (*Trans. ophthal. Soc. U.K.*, 1958) reports on the use of the priscol test in glaucoma. The eye is anæsthetized with "Decicain", the tension is measured, and then a conjunctival injection of priscol is given, the dose being 10 mg. in 0·4 ml. Tonometry is repeated at 15, 30, 60 and 90 minutes after the time of the injection. Fifty-one eyes were tested in 44 patients who were known to have chronic simple glaucoma. The mean rise in tension in 51 eyes was 11·98 mm. If a rise of 9 mm. is taken as a positive result, this series gave positive results in 80% of cases. Thirty eyes with angle closure glaucoma were tested, with positive results in 10 eyes. The author concludes that the priscol test is valuable in the diagnosis of chronic simple glaucoma.

Malignant Neoplasms of the Eyelid.

H. B. STALLARD (*Brit. J. Ophthal.*, March, 1959) discusses the relative merits of surgery and radiation in the treatment of malignant neoplasms of the eyelids. Radiation may produce complications as cicatricial ectropion and impaired lid mobility. An indolent ulcer may develop, particularly at the medial canthus, or necrosis of part or the whole of the full thickness of the lid may occur. Irradiation of the medial canthus may lead to closure of the puncta and canaliculi, producing a permanent epiphora. Superficial punctate keratitis, cataract and glaucoma are also possible complications. With surgical excision and reconstruction of the defect, eradication of the neoplasm is more certain, the structure and function of the reconstructed lid are more natural and mobile, and there is no damage to adjacent structures.

Alpha Chymotrypsin in Cataract Surgery.

A. B. RIZZUTI (*A.M.A. Arch. Ophthal.*, January, 1959) reports on the use of alpha chymotrypsin in cataract extraction. After the section, the anterior chamber is gently irrigated with 2 ml. of alpha chymotrypsin. An additional 3 ml. is used drop by drop over the area of the iridectomy. A waiting period of 10 to 15 minutes is allowed. The lens is removed by an erysophake, a lens forceps or, simply, a muscle hook. Extractions are performed through the round pupil or after a complete iridectomy. Thirty-two eyes were operated upon by this technique, and all lenses except four were removed intracapsularly. Alpha chymotrypsin must be used under sterile precautions and must not be contaminated by other solutions. A well dilated pupil and hypotonic eye produce a more satisfactory result. The immediate and late post-operative course in these cases was uneventful.

The Lens in Congenital Galactosæmia.

S. LERMAN (*A.M.A. Arch. Ophthal.*, January, 1959) had the opportunity to study the galactose metabolism in the lens of a child aged four weeks who died from congenital galactosæmia. The lenses were removed within one hour after death. He was able to demonstrate that the lens in congenital galactosæmia is lacking in the enzyme galactose-1-phosphate uridyl transferase. The oxidative metabolism of the lens epithelium in congenital galactosæmia appears to be markedly impaired.

The Importance of Peripheral Visual Field Tests.

F. BLUM *et alii* (*A.M.A. Arch. Ophthal.*, January, 1959) studied the central and peripheral visual field tests performed in a large eye clinic over a period of three years. Consecutive paired field tests were performed on 1892 patients. A white test object 2 mm. in diameter was used at distances of 330 mm. and 1000 mm. In the series studied only 25 field tests, representing 22 patients, gave positive results for the peripheral and negative results for the central fields. Out of 74 patients with positively diagnosed brain tumours, in not one case was a positive result to the test demonstrated in the peripheral part of the field with a negative result in the central part. In 162 cases of glaucoma there was only one case in which a central field test gave a negative and a peripheral field test a positive result. The authors conclude that the real value of routine peripheral field testing is open to question. In the cases in which there were positive findings in the peripheral parts of the visual field, these contributed little or nothing to the diagnosis, treatment or prognosis.

Keratoplasty for Keratoconus.

R. T. PATON AND G. SWARTZ (*A.M.A. Arch. Ophthal.*, March, 1959) discuss the relative merits of 6 mm. and 7 mm. grafts in the treatment of keratoconus. One hundred and nine grafts were performed for 81 patients. In 95 cases the grafts were 6 mm. in diameter, and in 14 cases 7 mm. grafts were used. All were penetrating. In 103 of the eyes the graft remained clear. After operation 95 patients were comfortable with ordinary glasses, while eight preferred contact lenses. In most cases the vision was excellent and satisfactory to surgeon and patient. The 6 mm. graft seems preferable in nearly all instances, the 7 mm. graft can be reserved for unusual cases of corneal thinness or for cases of very large

keratoconus. The danger of large astigmatic and myopic refractive errors can be minimized by being certain that the trephine is exactly at right angles with the cornea, that the graft is placed in an area of reasonably thick cornea, and that fixation of the graft is firm. In this series fixation was effected by overlying sutures and the Paton plastic guard. Edge to edge sutures were used only when they seemed necessary for extra security.

OTO-RHINO-LARYNGOLOGY.

Secretory Otitis Media and Nasal Allergy.

D. J. WEEKES (*A.M.A. Arch. Otolaryng.*, December, 1958) reports that a group of 66 patients suffering from secretory otitis media, seasonal and non-seasonal allergic rhinitis, and various other disorders of the upper respiratory system, received promethazine for symptomatic relief in conjunction with specific therapy for the underlying conditions. The usual dosage was 25 mg. taken orally at bedtime. The single bedtime dose of promethazine provided a desirable sedation. The prolonged antihistaminic action of the drug carried over throughout the following day, obviating the need of daytime doses, which are usually necessary with other antihistaminics and which cause an undesirable daytime drowsiness. At the end of treatment, 88% of the patients reported definite subjective improvement or elimination of symptoms. In 84% the improvement could be demonstrated objectively. No serious side-effects were encountered. In the few cases in which the desired soporific effect of the compound was prolonged beyond the hours of sleep, upper respiratory symptoms were controlled by reducing the dosage to 12·5 mg. without loss of therapeutic efficiency. In two instances the soporific effect was controlled by the use of 5 mg. of amphetamine in the morning and at noon. The author considers that promethazine is a valuable adjunct to the treatment of secretory otitis media, and he recommends it for symptomatic relief in upper respiratory disorders of established or probable allergic origin.

The Post-Auricular Flap in Mastoid Surgery.

P. H. BEALES AND W. HYNES (*J. Laryng.*, November, 1958), discuss the use of the post-auricular flap to secure rapid healing after mastoid surgery. They give figures relating to healing times of mastoid cavities and after fenestration operations. In all series examined the rate of failure to heal or of subsequent breakdown was high, and they conclude that about 20% of all mastoid operations fail to heal completely. They state that skin grafting seems to lead to more rapid healing but that the breakdown rate is higher. They consider that these results indicate that the present methods of dealing with the mastoid cavity after operation are most unsatisfactory. The authors think that in all mastoid cavities benefit would result if all raw surfaces, whether bone or soft tissue, could be provided with a covering of stable skin at the time of operation. They describe a method which they have used in a series of 25 cases. This method makes it possible to cover all exposed raw surfaces with epithelium. The authors also consider that hearing results after this method are better than those obtained after the use of standard procedures. The essence of this technique is the taking of a flap of skin and subcutaneous tissue from the middle two fourths of the posterior surface of the pinna. The flap is hinged just behind the retroauricular groove. A skin graft of medium thickness, measuring approximately 10 cm. by 5 cm., is also taken from the hairless inner aspect of the upper arm to be used in the tympanic cavity in cases of tympanoplasty. A meatal flap, based externally, is cut from the skin of the whole width of the posterior wall of the canal extending a little on to the roof and floor; this flap is made as long as possible, its distal end lying near the tympanic membrane. The pedicle flap is used to cover most of the mastoid cavity. The skin graft from the arm is used in the tympanic cavity. The remainder is used on the raw area of the pinna from whence the pedicle flap was cut. The meatal flap is turned backwards. Dressings are removed on the seventh day after operation. Any redundant portions of the graft can be removed with scissors.

Perforation of the Hypopharynx and Œsophagus.

B. H. COLMAN (*J. Laryng.*, December, 1958) states that in a series of cases of perforation of the hypopharynx and the cervical part of the œsophagus recorded between 1907 and 1949, more of these injuries (17 out of 24) were caused directly by the endoscope than by ingested foreign bodies. Perforation was usually at the level of impaction of the foreign body and occurred mostly through the poorly supported posterior wall. The author considers that except in special clinics with skilled operators, general anæsthesia and relaxants are preferable for endoscopy below the cricopharyngeus. Osteophytes associated with osteoarthritic changes or rigid cervical vertebræ, especially in the aged, increase the danger of perforation. In cases of gross immediate tearing, as by penetrating external wounds, by the endoscope, or by large bones, mediastinal spread of infection is rapid, due to lack of tissue barriers; the spread is usually into the prevertebral space. Pain is invariably present; sometimes when the perforation is small or is due to pressure erosion by smooth objects, e.g. coins, it is of late onset. Other symptoms are dysphagia, a dry troublesome cough, and cyanosis. Tenderness, most marked along the anterior border of the sterno-mastoid, may occur. Crepitation, appearing first in the suprasternal notch due to surgical emphysema, means a perforation below the cervical part of the œsophagus. Radiologically, the earliest sign of perforation is a widening of the soft tissue shadow between the trachea and the cervical part of the spine; later, gas may be seen in the soft tissues. In cases of instrumental injury and when there is evidence of infection, cervical mediastinotomy is indicated. In other cases a period of conservative treatment with close observation should be tried. Pus forms early, and the absence of pus when an incision is made usually means that the wrong space has been entered. A feeding tube is essential, and even the swallowing of saliva should be discouraged. Notes are given on relevant cases.

Tracheostomy.

J. M. LORE (*A.M.A. Arch. Otolaryng.*, December, 1958) discusses the indications for tracheostomy and describes with illustrations the anatomy related to the operation of tracheostomy and the technique of the operation. The post-operative care is given in detail. The indications and technique of tracheomediastinotomy (combined tracheostomy and bilateral cervical mediastinotomy) are described. The author urges that, except in rare instances as in the new-born, the policy of watch and wait should give way to the acceptance of tracheostomy, not as a last minute resort, but as a well executed and yet simply performed procedure.

Bell's Palsy Treated by Prednisone.

N. H. FABRICANT (*Eye, Ear, Nose, Thr. Monthly, February, 1959*) reports the cases of two patients with Bell's palsy who were treated with prednisone with excellent therapeutic results. Dosage consisted of six five-milligramme tablets per day for four days, after which the dose was reduced by one tablet every fourth day until only one tablet a day was being taken. In one patient some return of function was detected within five days, considerable improvement within two weeks, and complete recovery within three weeks. In the other patient improvement began on the seventh day and was pronounced at the end of two weeks. During the third week the dosage of prednisone was reduced at an accelerated rate because of pain from a concomitant duodenal ulcer. Almost complete recovery was evident after three weeks of treatment, and the pain from the duodenal ulcer had disappeared entirely.

Chronic Purulent Post-Nasal Discharge.

A. R. HOLLENDER (*A.M.A. Arch. Otolaryng.*, February, 1959) discusses the treatment of chronic purulent post-nasal discharge. To rationalize therapy, a differentiation should be made between chronic purulent post-nasal discharge and chronic "post-nasal drip". Before therapy is begun, an accurate determination of the site of the infection is necessary, and bacteriological studies on the purulent discharge should be made. The author discusses the etiology under the following headings: physiology, local processes, anatomical abnormalities, systemic influences, habits, allergy, hormonal dysfunction (notably hypothyroidism). The author considers that surgery should be contemplated only if there is interference with nasal function, that turbinal hypertrophy is more likely to lead to nasal blockage than to post-nasal drip, and that allergy is over-emphasized. Details are given of 50 patients who were studied. Of these, 10% improved with conventional therapy and, of the remaining 40 patients, the condition of 24 was improved by the addition of specific indicated antimicrobial agents.

Clinico-Pathological Conferences.

A CONFERENCE AT SYDNEY HOSPITAL.

A CLINICO-PATHOLOGICAL conference was held at Sydney Hospital on May 20, 1958; DR. J. REIMER was in the chair. The principal speaker was DR. B. J. LAKE.

Clinical History.

A woman, aged 52 years, was admitted to hospital with vomiting, polyuria, pain in the left loin, dysuria and anorexia. She appeared to be dehydrated (weight 10 st. 11 lb.); and she was febrile, her temperature being 100° F., with a blood pressure of 190/110 mm. of mercury. Considerable tenderness was present in the left loin, where probable enlargement of the kidney was commented upon, and examination of the urine revealed "heavy" albuminuria, glycosuria and acetone. The provisional diagnosis was diabetic precoma, hypertension, pyelitis and cystitis. Diabetes had been discovered six years previously, and her condition had been stabilized on 15 units of insulin twice a day; but she had had no injections for the past two years. For many years she had had repeated attacks of dysuria, and in six years she had lost 6 st. in weight. She had been treated for hypertension 10 years earlier and for anæmia two years earlier, and had had toxæmia with each of three confinements, one of which had produced a stillborn child. Her mother had died of pernicious anæmia and her father of unknown cause. One sister had hypertension. No relatives had diabetes. The blood sugar level was 356 mg. per 100 ml. on her admission to hospital, and thereafter varied between 267 and 490 mg. per 100 ml. Insulin dosage started at 60 units and then 30 units three times a day and was gradually increased to 150 units three times a day, but still glycosuria persisted, little or no acetone being present. During the second month insulin was suspended for a week without upset, but was then recommenced, and the dose was increased to 350 units three times a day. At one stage she received over 2000 units intravenously in one day without apparent effect on the blood sugar level, and a course of cortisone in full doses neither aggravated her condition nor improved the response to insulin.

Examination of urinary sediment repeatedly revealed paracolon bacillus, *Aerobacter*, *Escherichia coli* and *Streptococcus fæcalis*. She was treated with sulphonamides, then chloramphenicol, followed by streptomycin and her fever subsided. An intravenous pyelogram showed good excretion of dye by both kidneys, no calculi and no gross abnormality. The report on a cystoscopic examination was: "Marked infective polypi around bladder neck. Bladder urine dirty, mucosa shows inflammatory change. Faint blue from right ureter in 13 minutes, none from left in 15 minutes. Bilateral catheters passed: left did not drain even after syringing. Retrograde pyelogram shows irregular collecting system on both sides." A radiologist suggested the possibility of polycystic disease. Sulphonamides and chloramphenicol were again given. A blood count showed that the hæmoglobin value was 12·4 grammes per 100 ml., the erythrocyte sedimentation rate was 56 mm. in one hour, and the white cells numbered 12,100 per cubic millimetre (neutrophils 71%, eosinophils 1%, lymphocytes 25%, monocytes 3%). The Wassermann and Kahn responses were negative; liver function tests gave normal results; blood urea and creatinine levels were normal; urinary 17-ketosteroid excretion was normal; a chest X-ray film, a skull X-ray film and barium X-ray studies revealed no abnormalities. The cholecystogram showed slightly delayed emptying, with only fair filling; no calculi were seen; cholecystitis was thought to be present.

Trials with pig-insulin instead of beef-insulin were unrewarding, as was the search for an anti-insulin substance in the patient's blood by animal experiments and by precipitation and complement fixation tests. At the end of the second month she seemed a little better, though she still showed heavy glycosuria and a steady loss of weight. A large, tender mass was felt in the left hypochondrium, and suggestions were made about a pancreatic cyst or tumour. Insulin dosage was increased to 800 units three times a day. She developed signs of pneumonia at the base of the left lung, and died five months after her admission to hospital.

Clinical Discussion.

DR. B. J. LAKE: Mr. Chairman, the new chum approaching his task as principal speaker for one of these clinico-pathological discussions remembers the advice of Francis Bacon that reading maketh a full man, writing an exact man and conference a ready man. It is his task to bring contemplative hindsight to the problems that beguiled the patient's medical advisers and to try to be full, exact and ready to highlight and criticize the facts as known from the protocol.

The protocol today serves up a galaxy of information. Certain clinical aspects, however, are not mentioned which well might have been of great importance, and I will take it that by their absence the recorder has allowed that they are negative.

My reconstruction of the clinical data is necessarily selective, but so it is in everyday clinical medicine when we come to assess our findings. My rearrangement of the protocol is as follows: The patient, a woman, aged 52 years, had had toxæmia of pregnancy with each of three confinements, one resulting in a stillbirth. Toxæmia of pregnancy is unusual after the first confinement; it is unusual with all confinements in an otherwise healthy woman. This knowledge immediately makes one suspect recurrent or persisting renal tract disorder or hypertension, if fœtal abnormalities are absent. No comment is made on the birth weights of the children, an often valuable guide to the prediction of diabetes mellitus. High birth weights are well known to occur in the children of a diabetic woman, and follow-up studies on women whose children have consistently high birth weights reveal that a significant proportion of these women will develop diabetes at a later date, although not present at childbearing age. For many years our patient had had repeated attacks of dysuria; the "many" does not allow us to postulate whether this was before or after the discovery of diabetes, but with the history of repeated toxæmias of pregnancy I think it is likely that these attacks of dysuria, presumably of cystitis or of urethritis, were present since the childbearing stage.

She was known to have hypertension at the age of 42. This knowledge is useful, for we know the hypertension to be of considerable duration, present towards the end of the child-bearing period at least, and probably essential or renal in type. One sister also had hypertension. The fact of a sister having hypertension is a slight pointer towards a familial tendency to be in the upper range of the population's level of arterial tensions. Four years later, at the age of 46, she was discovered to have diabetes. She then weighed somewhere around 17 stone. She was said to have been stabilized on 15 units of insulin twice a day, but for the past two years she had had no injections.

Now, at the age of 52, she is admitted to hospital with symptoms of vomiting, polyuria, pain in the left loin and dysuria. On examination, she appears dehydrated and now weighs 10 st. 11 lb., having lost 6 st. since her diabetes was discovered. No indication is given as to whether this weight loss was deliberate, and whether she had had no injections of insulin because of apparent control of her diabetes by weight loss. Her blood pressure is 190/110. She has a temperature of 100° F., considerable tenderness in the left lumbar region, and a mass is felt, presumably an enlarged left kidney. The urine showed heavy albuminuria, glycosuria and acetone.

No other physical findings are mentioned. We must presume that she was not an obvious case of Cushing's syndrome with the typical facies and habitat, muscle-wasting, striæ, purpura, personality changes, that her skin was normally pigmented and that her fundi were normal. The liver was presumably not enlarged or tender. The provisional diagnosis made then was diabetic precoma, hypertension, pyelitis and cystitis.

At this stage the clinical picture seemed straightforward in terms of Gee's dictum of common things commonly occurring. We have no clue to there being present clinically any of the unusual forms of diabetes. Now we come to the first villain of the piece — she showed insulin resistance to the extent of failing to fit, faint or founder on the heroic 2000 units of insulin intravenously and on other parenteral dosage of similar order. Insulin resistance is a rare but well documented phenomenon, and differs clinically from the much more common sensitivity reactions in which the hypoglycæmic action is unimpaired and the effect is that of foreign protein on host, smooth muscle or vessel wall, leading usually to urticaria as the clinical manifestation. Almost all insulin-sensitive diabetics respond to a dosage under 100 units a day. A small percentage require more and are still capable of an adequate response. Above 200 units, the likelihood of insulin resistance is fairly certain, and this is usually meaning that however high the dose is raised thereafter, the diabetes takes its own course, be it mild or severe, judged by the blood glucose levels.

Major ways of raising insulin requirements are by raising metabolic requirements, especially through infection and in susceptible people by prolonged and marked emotional upset. These are usually only temporary adjustments; but with severe chronic infections the problem of the control of the diabetes is often very difficult and the patients are

hard to stabilize at anywhere near their pre-infection dosage. In some of the recorded cases of insulin resistance it has been found, by precipitation and complement fixation tests, that there is an antibody circulating to the specific insulin used. Beef insulin is the most usual preparation, and in these cases the use of pig or sheep insulin has resulted in a return to sensitivity—for how long does not appear to have been investigated, but is obviously of importance. Since Sanger's elucidation of the insulin amino-acid sequence, these variations in response are comprehensible, as the different species do have differences in sequence of the amino-acids. Nonetheless, it would seem only a matter of time before antibodies would be formed to any new type of insulin used.

Some of these insulin-resistant people have a raised globulin level on electrophoretogram, some seem to have the circulating insulin bound in the beta area. In the former case the insulin is still active when serum from the patient is injected into mice and in the latter case not so. Thus insulin resistance seems to be of more than one type. We know in our patient that she remained insensitive to those insulins commonly available, and that no insulin antibodies were detected in her serum by the usual methods. It is tantalizing to conjecture whether this serum would have been hypoglycæmic in another person or animal. The problem of insulin resistance would seem to be one of serum or tissue inactivation. It has been postulated that part of the rise in insulin requirements in an infection may be a non-specific reflection of the antibody rise caused by it. The use of cortisone here is an ironical comment on the stretched, almost circular usage of the versatile glucocorticoids. With its use one basically imposes a contrary set of conditions. Clinically one hopes the goody will come out on top as in the "crime does not pay" film —for the glucocorticoids greatly increase gluconeogenesis and thus the tendency to diabetes. At the same time, they also prevent the secondary tissue reactivity to certain tissue and vascular fixed antigen-antibody reactions. Here its use was responded to with the same *belle indifférence* as we noted above following the huge doses of insulin. Certainly this provocative cortisone test is a guide to the perplexed that Cushing's syndrome was not seriously considered as the diagnosis in our patient. In fairness, it might be stated that ACTH and cortisone exhibited in some cases of insulin resistance have remedied the situation, but this only in the antigen-antibody type. Finally, to comment on this fascinating puzzle of insulin resistance, it would be of great moment in any new case presenting to try the effects of the sulphonylureas such as "Rastinon", in attempting to elicit whether or not control of hyperglycæmia is possible. This group of drugs acts only when there is insulin present, and their exact locus of action is still uncertain. It would be of great practical and theoretical interest to find out whether the inactivation of insulin, endogenous or injected, also frustrated their effect.

Is the insulin resistance here the key to our diagnostic puzzle? I will discuss this partly under another heading. The possibility to be noted at present is that with the urinary infection rampant and only occasionally under control, the likelihood of pus formation would be ever present, and a likely precipitant of a vicious circle impossible to break with antibiotics alone without discharge of the pus, leading to the sort of situation where the diabetes is very difficult to control.

Now let us turn to the next conundrum, the patient's left side. Here we have, on admission, considerable tenderness in the left loin with the comment "probable enlargement of the left kidney". Two months later a large, tender mass was felt in the left hypochondrium. No comment is made about fullness in the left loin, tenderness, heat, and to which region our large left kidney has emigrated. After another three months signs of left basal pneumonia developed, two spaces and a muscle away from the kidney as the lymph flows, which threw the balance askew, leading to death. We do not know from the protocol what happened to the mass in the left hypochondrium in the three further months between its presentation and death. Are we to take it that her diabetes is in some way linked with this apparent key clue? Or is it something quite independent? We recently had Dr. Reimer catechise here the numerous layers of tissues with their burdens of cysts, neoplasms and abscesses, from retroperitoneal tissues, nerve chains, connective tissues of omentum and mesentery, bile duct and small gut, stomach and large gut, liver and spleen, adrenal and kidney, aneurysm and pancreas. I do not intend to repeat this, as he has done it so well. Anticipating, I shall draw your attention to the fact that none of the X-ray films of renal or gastro-intestinal tracts were reported as showing shift of organs or extra-viscus contrast shadows. For purposes of the discussion, I will consider that there is some relation between the diabetes and the state of the left hypochondrium. This narrows the field down to numerous, rather than inexhaustible, possibilities, and I shall at the moment consider that the original clinical findings in the left loin are in some way related to the second-month findings of a left hypochondrial tumour, and perhaps finally related to the chest condition which precipitated her death.

The relentless loss of weight is not much help. It could have been caused by severe diabetes, neoplasm, pus, terminal chronic renal disease, aortic aneurysm. The result of the only blood count suggests a neutrophilia, but as no repetition is included and its relation to the phase of illness uncertain, it needs no further comment, other than to emphasize that in diabetic infections a neutrophilia is often at minor levels in the presence of gross infection. The one erythrocyte sedimentation rate, a reading of 56, merely confirms what we really know—the patient is sick. The pneumonia at five months—is this a metastatic finale of neoplasm or pus, by direct or blood-stream infection? Is it a pulmonary infarct due to her prolonged stay in bed, or is it in fact quite a separate event leading to death? There are many puzzles, none greater than those relating to the renal tract, so we will dispose of those that are not clearly related to those parts first.

We may well start from protocol again, where pancreatic cysts or tumour were considered a possibility. Presumably the question of glucagon-producing tumour may be raised. Theoretically, by substituting an alpha in the beta positions of beta cell tumour, an alpha cell tumour should result. And if an alpha cell tumour, then perhaps a glucagon-producing tumour; and if a glucagon-producing tumour, then more likely to be found in the tail and body of the pancreas where most of the million and a half islands live; and if a secreting-glucagon tumour, then capable of producing insulin resistance. However, the presently understood mechanisms of glucagon render it unlikely that, even if produced in large doses, the hormone could play this role. Glucagon, produced by the alpha cells of the pancreas, acts on a phosphokinase system in the liver, and indirectly by aiding the reactivation of this system leads to increased glycogen breakdown to glucose. In terms of glucose production it can make what it will of the liver stores into sugar, but it will at the same time increase the peripheral utilization of glucose. The net result is a short-term transient hyperglycæmia and glycosuria. Prolonged high dosage of glucagon injections experimentally has failed to produce the diabetic state. In fact, it has been used in difficult diabetics whose blood sugars rise and fall hectically on insulin as a means of producing finer control. I think we had best renew our quest elsewhere.

Next we would consider the condition of chronic relapsing pancreatitis with pseudocyst formation terminally. This might well produce a condition of diabetes with hypochondrial mass; but the prolonged recurrent history of upper abdominal pain, pain in the back, a variety of gastro-intestinal symptoms with these attacks, in some a history of jaundice—none are given us to build on, and only through the possibility suggested of the much more common cholecystitis does a breath of pancreatic disease stir.

Tumour of the adrenal medulla is highly unlikely, as the history is not a fluctuating one, lacks the vasomotor and cardiac crises and the very high blood pressure usually recorded. The diabetes of phæochromocytoma can only be produced by adrenaline increasing breakdown of glycogen, which is a fluctuating, transitory phenomenon. The effects, of course, vary with the amount of adrenaline and noradrenaline actually secreted into the blood, but are roughly proportional to the size of the tumour, which here would have to be a massive one. Further, I am heartened that in a battery of tests undertaken, the "Regitine" or other similar test is not admitted, and the urinary catechol amines likewise do not gain mention.

A glucocorticoid-secreting tumour of the adrenal cortex might well have been considered from the meagre hints dropped clinically of a gross, mountainous, hypertensive, diabetic woman losing weight, except that they are so meagre and non-specific; but we are faced with the use of cortisone, and hence this is out. We might also mention that the 17-ketosteroids were also normal; but this might just have been so with a glucococorticoid-secreting tumour, too. The diabetes of hæmochromatosis deserves a brief nod, only by way of reminding us that it is exceptional in women, and in them unlikely to appear before the menopause *plus* 20 or 30 years.

The diabetes of hyperactivity of pituitary and thyroid glands is mentioned only to be dismissed for lack of substantiation.

A primary or secondary neoplasm of the pancreas has to be very extensive to produce diabetes, and usually there are numerous clinical symptoms before diabetes becomes present—it is usually preterminal. This time *plus* six years

and five months, as in our particular case, puts primary and secondary neoplasm of the pancreas out of the picture.

Next we pass to the gut — here again there is a total absence of symptoms. We must postulate the silent neoplasm of the stomach (shades of the family history of pernicious anæmia!), silent neoplasm of the large gut in the region adjacent to the splenic flexure. Those of the small gut are rarely silent for so long. We can scarcely postulate diverticulitis with pericolic abscess or carcinoma or fistula unless we are prepared to disregard the unity of the exercise, calling the initial pain and mass in the loin pyelonephritis and the hypochondrial mass something else.

Barium meal and follow-through showed no lesion. Barium enema does not seem to have been done, but no symptoms are included in the protocol. And so we come to the renal tract. The specific complication of diabetes in the kidney is the presence of the intercapillary glomeruloscierosis, only diagnosed in life in one of three diabetics having it, this being partly due to the fixation on the classical description of diabetes, hypertension and albuminuria. The finding of retinal microaneurysms in a diabetic should lead to a high suspicion index of consistent analogous renal disease. All those who have the renal lesions have retinal vein microaneurysms, but not many more do have the retinal microaneurysms than the renal lesions. The clinical history of this Kimmelstiel-Wilson lesion *per se* is usually much more silent than the picture of this patient. It would not surprise me to find in an examination of her kidney that the lesion was present, but I do not think it responsible for the whole clinical picture. By far the most common renal tract complication in diabetes is infection, a diabetic being particularly prone to some infective disorder of the renal tract. It is all too easy for a simple cystitis or urethritis in these people to become an acute pyelonephritis, to become recurrent and lead to chronic damage throughout the whole renal tract. There is a very severe form of acute pyelonephritis which was much commoner in the preantibiotic days, called necrotizing papillitis, with gross infection of the tips of the papillæ adjacent to the renal pelvis, with endarteritis of the papillary vessels and finally necrosis of the papillary tip. This is most commonly seen in diabetics, and usually is associated with an acute dramatic picture with pain in the loin, high fever, "heavy" albuminuria and persistent bacilluria, usually coliform organisms. Previously it led to death. If enough papillæ remain unaffected, in these days with the use of antibiotics the patient may survive, and the papilla may finally be reduced to a fibrous remnant and be cast into the renal pelvis, and is a known cause of renal colic, and of course becomes a nidus for further infection, or some part of it may even be passed *per urethram*. Our patient showed a persistent bacilluria of intestinal origin and persistent albuminuria, and was admitted with just such a history. Incidentally, in some of the reported series of this condition coincidental cholecystitis has been commented on. But as cholecystitis is so common in this age group and especially in diabetics, I do not feel this to be of much diagnostic assistance here. At this stage we must now turn to the help available from urography.

The intravenous pyelogram showed "normal excretion of the dye by both kidneys, no calcification and no gross abnormality". I think we would agree with this. The result of a cystoscopic examination was "marked infective polypi around bladder neck. Mucosa shows inflammatory change". This is as might have been expected. "Faint blue from the right urethra in eleven minutes, none from the left in fifteen minutes." Two minutes are usually allowed after the intravenous injection of methylene blue for its appearance at the lower end of the ureter. Up to five minutes is equivocal, and beyond that the delay is definitely pathological, allowing that the injection was not outside the vein. This finding is, then, suggestive that there is some defect in renal function not present at the time of the intravenous pyelogram. A retrograde pyelogram is said to show irregular collecting system on both sides. The radiologist suggests the possibility of polycystic disease. This scared me, so I consulted Dr. Marsh, because I felt that the retrograde pyelogram showed a relatively normal right kidney and an irregular collecting system only on the left side and no signs of polycystic disease, as there were no cyst outlines or irregularity of outline of the kidney or kidneys, and the irregularity was not of a spider type seen in that disease. Now the appearance of a necrotizing papillitis may simulate radiologically an early tuberculosis of the kidney, with specks of calcification and an irregular collecting system as seen in the left kidney, and this picture could well be the picture of necrotizing papillitis.

Apart from the definite enlargement of the heart, there is nothing grossly abnormal in the X-ray films.

In regard to her terminal illness, we can only do a bit more guesswork. It does not help us in coming towards a diagnosis; it could have been a pyæmic or neoplastic or pulmonary infarct or a simple pneumonia arising *de novo*.

I choose between renal neoplasm which has to be obviously considered in view of pulmonary complications if we regard this all as a unity, and abscess, as the cause of the mass in the left hypochondrium, only because the presence of neoplasm does not raise insulin requirements to my knowledge, whereas the presence of a bag of pus certainly does, or persisting chronic infection. There is no reason, of course, why the two could not coexist, and it is quite arbitrary that I have chosen the whole picture as being interrelated.

Finally, I would like to say that perinephric abscess is a common complication of diabetes, difficult to diagnose, as it does not reproduce all the classical symptoms or signs and is not always visible on X-ray examination, but I think here may well have been associated with the acute on chronic renal tract disease; especially if you accept my interpretation of the X-ray findings — the pushout of the kidney, the abscess of the psoas and the absence of clear definition of the kidney outline.

DR. REIMER: Would one of the students like to speak concerning this case.

STUDENT: I would like to ask what Dr. Lake feels about polyarteritis nodosa as a diagnosis?

DR. REIMER: Dr. Lake, would you like to respond to that question?

DR. LAKE: I would like to ask, why polyarteritis nodosa?

STUDENT: That would explain the hypertension, and also the involvement of the pancreas might lead to pancreatic destruction and thus diabetes.

DR. LAKE: I am not aware of polyarteritis nodosa *per se* causing diabetes, but I am willing to be told that it could do so. I think the suggestion is a valid one. Polyarteritis has protean manifestations—a very high persistent fever, very marked leucocytosis, the chest is almost always involved and certainly renal disease. I agree in retrospect that I should have included it, excepting that I was taking first things first, and this woman had such clear-cut renal tract disease.

DR. REIMER: Dr. Marsh might like to add to our knowledge of the radiological interpretations.

DR. H. G. MARSH: I think that Dr. Lake discussed the films very thoroughly. In the intravenous pyelogram both kidneys are seen to be functioning, and then a month later we are told that the left kidney did not function. Something must have happened in the interval. In the retrograde pyelogram, as Dr. Lake pointed out, we cannot see a well-defined psoas shadow, the kidney is displaced, the renal outline is not well seen but appears enlarged. I am unable to say whether this is a tumour or an abscess. A tumour of the tail of the pancreas is not completely excluded, but to tie the whole protocol together, perinephric abscess with spread to the pleura seems the most likely diagnosis.

DR. D. G. MAITLAND: I agree with Dr. Marsh that a change has occurred in the shadow outline of the left kidney. The haziness of the psoas and the kidney outline on that side means that the perinephric fat, which contrasts, or shows out, the normal kidney shadow, has been obliterated by œdema. In regard to the two postero-anterior films of the patient's chest, I would not say that the heart shadow showed enlargement, because at the instant each film was taken, the heart may have been in systole in the one and in diastole in the other. Also, we must judge whether the films were made at exactly the same distance, or whether one shows shadow enlargement distortion. These two films, however, were obviously taken at the same distance, because the shadows of the whole thoracic cage are the same size in each, although the heart shadow is not quite the same size. The pneumonic patch at the left base, together with the left renal shadow changes, should be consistent with a perinephric abscess.

DR. REIMER: Would any of the registrars like to comment on this case?

DR. W. E. L. DAVIES: We must admire Dr. Lake's survey of the whole landscape in this case, but may I pick out several prominent features? I think necrotizing papillitis is unlikely because of her long history in hospital. Chronic pyelonephritis is not likely, because the left kidney was large on arrival. Perinephric abscess is probably the diagnosis, and might well account for her precomatose state when she first arrived, and for the high insulin requirements during her stay.

MR. L. A. JACOBS: There are a number of anomalies in this case. I do not agree that there is a difference between the intravenous pyelogram and retrograde pyelogram. I

think they are essentially the same, for these reasons. It is said in the protocol that there is full blue from the right side in 13 minutes (I quote from memory). The intravenous pyelogram function, to me, means more than when the blue comes down (which depends on the position of the catheter). It says further "no blue from the left side in 15 minutes"; but if you read through, it says nothing came from the left side at all, which may only mean that the catheter is in the wrong place — it does not necessarily mean that the kidney is not functioning. Therefore it does not follow that the left kidney is different in the retrograde from what is was in the intravenous pyelogram. Looking at it here, I do not think it is. The shape of the collecting system in both is exactly the same; in both of them the kidneys are pushed over, the outline of the kidney being lateral to what it should be, and, further, the left kidney shows some tendency to be lower than the right one, which is again an abnormality of some significance. As far as necrotizing papillitis is concerned, one must consider the two kidneys together. These are not very good films; they are not good enough to say they are normal, although they show no gross abnormality. Necrotizing papillitis is usually bilateral, and there is no real evidence of this disease in these films. I agree the most likely diagnosis here is a space-occupying lesion in relationship to the left kidney. Certainly the psoas shadow in the intravenous pyelogram seems to be a little indefinite, and the kidney is pushed laterally, particularly the lower pole, and I should think that the possibility of some perinephric mass is the most likely thing.

The only thing I have added is the fact that, as far as "blue" is concerned, the times given cannot be believed. Such figures often depend on how lucky you are in getting the catheter into the right place, not always an easy thing.

DR. E. H. STOKES: I would say this was an insulin-resistant case with chronic urinary tract infection with a mass in the left side, and putting those things together, it spells perinephric abscess.

DR. R. G. LEWIS: The only thing I would like to say is that Dr. Lake discussed the causes of insulin resistance extremely well. I think the important lesson to be learnt is that in a case of insulin resistance, if one can exclude improper supervision of the patient's diet, infection will quite often be found. I agree with the diagnosis of perinephric abscess.

DR. REIMER: Dr. Shearman would you like to comment on some of the aspects of insulin resistance?

DR. C. H. SHEARMAN: I was asked to carry out some complement fixation tests on this patient's serum with a view to determining the presence or otherwise of insulin antibodies. Both pig and ox insulins were used as antigens. In each instance, however, no evidence of insulin complement-fixing antibodies was detected. When a patient is treated with an insulin derived from animal sources, two types of immunological reaction may occur, each being due to a separate antigen. In all insulin preparations there is a certain amount of animal protein singular to that animal. In addition, insulin, itself a protein substance, is also capable of evoking an antibody. The patient may respond immunologically by producing an antibody to either or both of these proteins. The antibody evoked by insulin is active against all insulins, whatever their source.

In examining a serum for the presence of insulin antibody (one form of insulin resistance), it is essential to know what type of insulin was used in treatment. If the insulin preparation used as antigen is the same as that used therapeutically, a positive complement fixation test could result due to the reaction between the contaminating protein and its antibody. This can be avoided by using as antigen an insulin derived from a different source from that used in treatment. If other insulins are not available, or if many types of insulin have been used in treatment, absorption tests may be employed to eliminate the contaminating protein or its antibody. Other means of demonstrating anti-insulin antibodies are those involving the use of animals (usually mice). In these tests, the antibody is demonstrated by the protective power of the patient's serum against a dose of insulin which would normally produce signs of hyperinsulinism in the animal.

DR. REIMER: Would Dr. Lake like to comment before we make the pathological *dénouement*?

DR. LAKE: The thing that puzzled me was the insulin resistance without antibodies. This has occurred in other reported cases, and it has been assumed to be inactivated; in other words, that in being bound to globulin in the serum something happens to the insulin, making it completely innocuous as far as producing hypoglycæmia, and in some way refuses to allow it to be antigenically detectable by the usual tests. However, the other thing is, in not detecting antibodies one should always search for chronic infection somewhere.

Autopsy Report.

DR. A. A. PALMER then gave the post-mortem finding. The body was that of a well-nourished female, weighing 132 lb., although she was said to have lost a lot of weight. The thyroid appeared normal. The thymus was atrophic. The breasts were atrophic. There was some pleural effusion (8 oz.) on the left side. Both lungs showed some œdema and congestion, and the left lower lobe was partly collapsed. The pericardial sac contained 8 oz. of clear fluid. The heart was enlarged, weighing 21 oz. The coronary arteries showed advanced atheroma with patchy narrowing and calcification.

In the abdomen, on the left side there was a fluctuant retroperitoneal mass, which proved to be a large perinephric abscess extending from the diaphragm to the pelvic brim. The abscess contained about two pints of pus, and communicated with one of a network of abscess cavities in the left kidney; it had displaced the left kidney laterally. The right kidney was enlarged and showed chronic pyelonephritis. There was some chronic venous congestion of the liver. The spleen was enlarged, soft and friable and weighed 11 oz. The pancreas and left adrenal appeared normal. The right adrenal was not identified in the abscess cavity. There were no other significant changes.

The following photomicrographs were then shown: (i) Perinephric abscess: a rather thick fibrous wall indicated that the abscess was of some standing. (ii) Left kidney: the sections showed active chronic pyelonephritis and conspicuous arteriolar hyalinization, such as would be expected in a hypertensive diabetic. (iii) Pancreas: many of the islets showed hyaline change varying from slight to extreme.

Summary.

(i) Diabetes mellitus. (ii) Extensive left perinephric abscess associated with pyonephrosis. (iii) Right chronic pyelonephritis. (iv) Hypertensive cardiac hypertrophy. (v) Left pleural effusion and some œdema and small infarcts in the lungs.

Discussion.

DR. H. M. WHYTE: This was a treatable condition, and on behalf of the lady herself I would like to ask a question. Why is it that physicians, radiologists and urologists, representatives of the same services that saw her during life, can arrive at the diagnosis now, but not then?

DR. JACOBS: This is a matter of hospital routine. This is a girl who was referred to the urologists, and whether they saw her or not beforehand I know not; but very often they are sent up solely for a retrograde pyelogram. Well, she had that done and we would have seen only the wet films at the time, which are not always easy to tell things from. Only if she had been referred back to us would we have reviewed her films, her case and possibly made the diagnosis.

The College of General Practitioners.

ANNUAL MEETING.

THE first annual general meeting, which was in effect the inaugural meeting of The Australian College of General Practitioners, was held in the Great Hall of the University of Sydney on March 20, 1959. Members of the College Council and official guests, who included representatives of the University of Sydney, the University of New South Wales, the Royal Australasian College of Surgeons, The Royal Australasian College of Physicians, the Australian Regional Council of the Royal College of Obstetricians and Gynæcologists, the College of Radiologists of Australasia, the College of Pathologists of Australia, the Federal Government, the British Medical Association and the Post-Graduate Committee in Medicine in the University of Sydney, proceeded to the dais in academic procession.

After the Honorary Secretary of the College, Dr. H. M. Saxby, had read the notice convening the meeting, the meeting was opened by the Chairman of the College Council, Dr. W. A. Conolly. The Secretary presented apologies for non-attendance at the meeting.

The Chancellor, Sir Charles Bickerton Blackburn, then welcomed members of the College and their guests to the University.

The meeting resolved, on the motion of the Chairman, seconded by Dr. B. N. Adsett, that the annual report, financial statement and auditors' report, having been printed and sent to members, be taken as read, received and adopted.

The Deputy-Chairman of the College Council declared Dr. William Arnold Conolly elected as the first President of the College.

The President then announced the names of representatives appointed by Faculties to the Council of the College, as follows:

New South Wales Faculty: Dr. J. G. Radford, Dr. H. M. Saxby, Dr. C. Warburton.

Queensland Faculty: Dr. B. N. Adsett, Dr. R. A. M. Miller.

Tasmania Faculty: Dr. A. C. D. Corney, Dr. T. C. James.

Victoria Faculty: Dr. R. D. Bartram, Dr. M. O. Kent-Hughes, Dr. D. Zacharin.

Western Australia Faculty: Dr. C. W. Anderson, Dr. D. M. Clement.

It was resolved, on the motion of the Honourable R. J. D. Turnbull, seconded by Dr. L. R. Mallen, that Messrs. Cooper Brothers, Way and Hardie be appointed auditors to the College.

Dr. Colin Anderson presented Dr. Ian Grant for admission to Honorary Fellowship of the College. Dr. Anderson spoke as follows:

> Mr. President, Ian Dingwall Grant is a Bachelor of Medicine and a Bachelor of Surgery in the University of Glasgow and a Doctor of Medicine, *honoris causa*, in the University of Birmingham. Dr. Grant is a distinguished general practitioner in the City of Glasgow, he is President of the College of General Practitioners, a Vice-President of the British Medical Association, a member of the General Medical Council, and until recently Chairman of the Representative Body of the British Medical Association.
>
> I have the honour, Sir, to present to you Ian Dingwall Grant for admission to the Honorary Fellowship of this College.

The President admitted Dr. Grant to Honorary Fellowship, and Dr. Grant replied in an address (see page 825).

After the annual general meeting, the President and Mrs. Conolly and Dr. and Mrs. Grant received members of the College and their guests at the Union Refectory, where supper was served.

Medical Matters in Parliament.

HOUSE OF REPRESENTATIVES.

THE following extracts from *Hansard* relate to the proceedings of the House of Representatives on April 15, 1959.

Solar Eclipses.

MR. OPPERMAN: My question is addressed to the Minister for Health. Has the Minister noted the most unfortunate aftermath of the recent eclipse of the sun, which has left so many children suffering from irreparable damage to their eyes? Can the Minister indicate whether, when the next partial eclipse is due, in March, 1960—in the comparatively near future—action can be taken to ensure that adequate publicity and advertising material is distributed throughout Australian schools, and whether special lectures can be given to pupils to indicate the danger inherent in gazing at these interesting but, in most cases, dangerous solar phenomena?

DR. DONALD CAMERON: I have noticed that there have been—and I am very sorry to say it—quite a number of reports of permanent affection of children's eyesight from looking at the recent eclipse of the sun, and I agree with the honorable gentleman that it would be most desirable that the danger should be publicized before the next eclipse occurs. Prior to the recent eclipse, I issued to the Press and the Australian Broadcasting Commission a statement on its dangers, and this statement, so far as I know, was published throughout the Australian Press about five days or a week before the eclipse occurred. I happened to be in Queensland at the time, and I saw the statement quite well displayed in both the metropolitan and the country Press in that State; and I have no doubt that it was displayed similarly throughout the rest of the Commonwealth. However, if there is anything further that can be done in the future, I shall be glad to do it.

MR. WILSON: I desire to address a question to the Minister for Immigration, following on the question of the honorable member for Corio, which called attention to the number of children whose eyes have been affected by looking at the eclipse of the sun. I ask the Minister whether he will issue to migrants, through every available channel, a warning of the danger of watching an eclipse of the sun. Honorable members will have noticed the number of migrant children whose eyes have been affected. Probably their parents were unable to understand the language or to read the newspapers.

MR. DOWNER: I thank the honorable member for Sturt for his suggestion. I shall certainly investigate what he says and shall cause inquiries to be made as to whether we can usefully issue the notices for which he asks. On the other hand, I think it is only fair to bear in mind that, according to the comments of astronomers published in the newspapers, the eclipse of the sun which we had last week was, as I understand it, the most dramatic that perhaps any of us will see in our lifetime in Australia. I believe that there will not be an eclipse of such magnitude until the end of the century when, of course, I hope that my honorable friend will still be alive and that I will be too. Nonetheless, the danger mentioned by the honorable member cannot for the next 40 years be of such magnitude as was so unfortunately the case last week.

Poliomyelitis.

MR. SWARTZ: Will the Minister for Health inform the House what progress is being achieved in the Commonwealth anti-poliomyelitis campaign? Are sufficient stocks of Salk vaccine being prepared to cover full continuity of the campaign? What are the age groups which have so far been covered, and when is it anticipated that the next age group will be covered?

DR. DONALD CAMERON: Mr. Speaker, for the purposes of this campaign the population is divided into three age groups—from birth to 14 years, 15 to 44 years and those above 44 years. The campaign is a continuous process. It is not a question entirely of finishing one age group before going on to the next because the honorable gentleman will realize that new entrants are continually arriving in each age group.

I think that approximately 2,250,000 children have received a full course of injections and perhaps another 400,000 will have had one or two injections, so that very good coverage has been obtained in that age group. In the intermediate age group from 15 years to 44 years, there has not been nearly so good a cover, nor is it easy to arrange with adults to attend for mass immunization; at any rate, it is not as easy as it is with children. All the same, between 750,000 and 800,000 adults have now had at least one injection and, speaking from memory, I think that perhaps 100,000 to 103,000 or 104,000 have now had the full course.

I take this opportunity to say how very important it is for adults to submit themselves for inoculation because we will deceive ourselves if we imagine that inoculation of the children will provide any protection for adults, in whom poliomyelitis can be a very severe disease. Mass immunization is not considered necessary for the final age group.

As to the honorable member's question about the stocks of Salk vaccine, the answer is that adequate quantities are held to permit the campaign to be continued on the present scale.

Social Service Benefits.

MR. STEWART asked the Minister for Social Services, upon notice:

1. Is a special allowance payable to persons required to remain at home to care for an invalid?
2. What is the amount of this allowance?
3. Is a means test applied before granting the allowance?
4. If so, what are the details of this means test?

MR. ROBERTON: The answers to the honorable member's questions are as follows:

1. Yes, financial assistance may be granted in the type of case mentioned by the honorable member by way of either special benefit or wife's allowance. A special benefit may be granted in the case of a person caring for an invalid parent or parents or other near relative. A wife's allowance may be granted to the wife of an invalid pensioner or permanently incapacitated age pensioner.
2. A special benefit may be granted at a rate of up to £3 5s. a week. The maximum rate of a wife's allowance is £1 15s. a week.
3. Yes. Both special benefit and wife's allowance are subject to a means test.
4. Wife's allowance is subject to the same means test as age and invalid pensions. Special benefit is a discretionary payment and there is no statutory means test. Payment is made on the basis of hardship.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

ERYSIPELAS IN THE MELBOURNE HOSPITAL.[1]

[From the *Australasian Medical Gazette*, 1882.]

DURING the past month our attention has been pretty equally divided between smallpox at the Quarantine Ground and erysipelas at the Melbourne Hospital. Instead, if it had not been for these several subjects of discussion Christmas would have been dull. And the erysipelas controversy all came from a question casually put to the city coroner, Dr. Youl, at an inquest he was holding, at the Melbourne Hospital, upon a man, who had died from erysipelas following upon a wound of the scalp. A juror wanted to know if the erysipelas could not have been prevented by putting the patient into a ward in which erysipelas cases had not been treated: and Dr. Youl replied that the hospital was so saturated with erysipelas poison, that unless the building were pulled down there was no mode of preventing erysipelas occurring in it: whereupon the honorary staff, the resident staff and the Committee arose in anger, and denounced the coroner as a very rash person. Accordingly there were reports, and subcommittees, and letters, and leaders all bearing on the question, and making a great many suggestions how to get rid of erysipelas. But when the statistics began to be employed in the settlement of the controversy, it was seen that there had been only eighty cases of erysipelas in the hospital during the year, and out of these only six deaths. For all that, it was contended that as erysipelas was an avoidable complication, it ought to be avoided, and that an institution like the Melbourne Hospital, professing to be the leading medical charity in the Australias, ought to set an example of perfect precautions against such a contingency.

Correspondence.

THE AUSTRALIAN COLLEGE OF GENERAL PRACTITIONERS: ANNUAL MEETING.

SIR: May I ask the courtesy of your columns to express, on behalf of Mrs. Grant and myself, our most sincere thanks to the many doctors and their wives who have made our tour of the Faculties in Australia so memorable. We shall never forget the innumerable kindnesses we received from so many people—lay and medical—and for the most generous hospitality which was accorded to us during our visit. We both feel that we have made many new friends and have learned something of the Australian way of life.

I feel confident that The Australian College of General Practitioners will exercise an outstanding influence for good in the medical world of your great country.

Yours, etc.,
IAN D. GRANT,
President, College of General Practitioners, Great Britain.

50 Elizabeth Street,
South Perth,
April 6, 1959.

THE RESULTS OF TREATMENT OF OBESITY.

SIR: In view of your recent "Current Comment" on obesity, I thought my experience in a small number of cases, using methylpentynol carbamate ("Oblivon C") may be of interest to some of your readers.

The patients were women who had been unsuccessful in maintaining a diet and consequently had not lost any weight. Methylpentynol carbamate, 200 mg. (two tablets), was prescribed three times a day in conjunction with a dietary régime. In each case the patient has lost weight and has found her compulsive eating habits quite controllable with the help of this drug. It would appear that in these cases tension and anxiety were responsible for the excessive eating.

Yours, etc.,
A. FELDMAN.

75 Curlewis Street,
Bondi Beach, N.S.W.
May 27, 1959.

MEDICINE AND ATOMIC ENERGY.

SIR: Your leading article "Medicine and Atomic Energy" (MED. J. AUST., May 9) will have achieved a great deal if it succeeds only in directing attention to those two classics of our time, Hersey's "Hiroshima" and Lapp's "The Voyage of the Lucky Dragon". I thought it a great pity, however, that on the matter of organization within the profession to face the implications of the atomic age, the article became timorous, and even unreal.

Nuclear war in the near future must be seen as a distinct possibility. Every nation which possesses the nuclear technology is preparing to wage such a war. We of the West hold that our activity is directed toward the preparation of a deterrent, rather than an aggressive instrument. Those whom we see as our potential enemies protest the same intention. There is of course no difference between a deterrent atomic arm and an aggressive one. Atomic defence, in the military sense, was summed up accurately by the late Mr. John Foster Dulles when he gave his name to the phrase "massive retaliation". Defence, in the sense of fortification to resist assault or organization to withstand siege, has no meaning in the modern concept of war. The word "defence" has become, severally, a plaything for obsolescent military planners, an apology for appalling public expenditure, a refuge-term for people whose thinking on international tensions is still rooted in the gas-lit era.

As you say, it is now apparent that the world changed in 1945. Equally true, I believe, is your sentence, "medicine is firmly involved in this situation". This new situation is one of numerous facets. We may await understanding of most of them, but a few we must grasp now. Of the urgent ones, consider modern war—nuclear war. There is not throughout the world a single national leader or military chief of any responsibility who now denies that nuclear war would be bilateral suicide for the participants. In what way, Sir, should one go about organizing for suicide?

It appears to me that any idea for the organization of a medical defence is, similarly, a delusion. To protest that the profession has a traditional role to play, and must prepare to play it again, is unreal in the light of the historical change to which you refer in your opening paragraph. That change saw the end of many things, among which was the concept of a feasible medical service in war. The researches of such workers as J. J. Morton (MED. J. AUST., May 9) will in time provide us with the means to deal with some of the casualties within the microcosm of nuclear industrial accidents; but to see such work as a fund of knowledge upon which can be erected a medical defence in nuclear war, is to assume that awaiting a fringe of unfortunate survivors from an atomic assault there will still exist, not only a relatively intact medical organization, but a relatively intact society in which it could function. It is to assume that nuclear war will bear some resemblance to previous wars. But this is absurd.

I agree that we must, within the profession, organize to deal with the possibility of nuclear war. But let us be contemporary in our thinking. In these times it is highly dangerous to be obsolete. I feel that the profession must endure some painful reappraisals before it can speak, with any sense of reality, on this matter of an attitude toward nuclear war. For instance, we should reject the dearly-held notion that the use of nuclear weapons in war is primarily a political matter, and not one to occupy the mind of the profession. It has already ceased to be a political matter. It has become a fundamental human matter. For the profession to claim aloofness at this stage is to claim an identity remote from, and unrelated to, society.

We should at once muster sufficient courage, and humility, to inform the community precisely how little can be expected from any proposed medical service in the event of nuclear war. We should realize, and accept, the fact that in these times the only defence from war is prevention of war. Keeping in mind the sanctity in which we claim to hold human life, and remaining aware that our counsels are (still) regarded highly by the community, the profession should join, and energetically support, any

[1] From the original in the Mitchell Library, Sydney.

organization which is devoting its efforts to the prevention of war—the only real problem of our time.

There is nothing here which is simple. It would be easier to change the traditional argument than to bring it up to date. But our thinking must be made modern if the terms of your assertion—that the world changed in 1945—is true. If on the other hand your assertion is premature, then we may rest, and await the arrival of history.

Yours, etc.,
W. S. BENWELL.

Clifton Hill,
Melbourne,
Victoria.
May 26, 1959.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Week-End Conferences.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the following post-graduate week-end conferences will be held during July, 1959.

Hornsby.—In conjunction with the Kuring-gai Medical Association, a post-graduate conference will be held at the Hornsby and District Hospital on Saturday and Sunday, July 4 and 5. The programme is as follows:

Saturday, July 4: 2 p.m., registration; 2.15 p.m., "Toxæmias of pregnancy", Professor Bruce T. Mayes; 3.45 p.m., "Common skin diseases and recent advances in treatment", Dr. E. J. C. Molesworth.

Sunday, July 5: 9.30 a.m., "Management of cerebral vascular accidents, and Parkinson's disease" (with film), Dr. George Selby; 11.30 a.m., quiz session—panel: Professor Bruce T. Mayes, Dr. E. J. C. Molesworth and Dr. George Selby.

The fee for attendance is £2 2s., and those wishing to attend are requested to notify Dr. R. C. Geeves, 18 Yarrara Road, Pennant Hills. Telephone: WJ 2235.

Wollongong.—In conjunction with the South Eastern Medical Association, a post-graduate conference will be held at the Wollongong General Hospital on Saturday and Sunday, July 18 and 19. The programme is as follows:

Saturday, July 18: 1.45 p.m., registration; 2 p.m., "Head injuries", Dr. Douglas Miller; 3 p.m., "Some observations on lung cancer", Dr. Maurice Joseph; 4.30 p.m., "Drug eruptions", Dr. E. J. C. Molesworth.

Sunday, July 19: 9.30 a.m., "Intervertebral disk lesions and sciatica", Dr. Douglas Miller; 11 a.m., "Treatment of some common pulmonary conditions", Dr. Maurice Joseph; 12 noon, "The management of common skin conditions in general practice", Dr. E. J. C. Molesworth.

The fee for attendance is £3 3s., and those wishing to enrol are requested to make early application to Dr. Peter J. Geddes, Honorary Secretary, South Eastern Medical association, 2 Campbell Street, Woonona. Telephone: Corrimal 8-3354, or 8-0338.

Examination Results.

The Post-Graduate Committee in Medicine in the University of Sydney announces that the undermentioned candidates satisfied the examiners at the recent examinations for the Part II Diploma in Psychological Medicine of the University of Sydney: Barclay, W. A., Bell, D. S., Collins, G. M., Grant, W. B., Higgin, J. P., Shand, J. W.

These candidates are now eligible for the award of the Diploma in Psychological Medicine.

SEMINARS AT SYDNEY HOSPITAL, JULY AND AUGUST, 1959.

THE following seminars at Sydney Hospital will be held in the Maitland Lecture Hall on Wednesdays, from 2 to 3 p.m. Each seminar will be preceded by medical grand rounds at 12 noon (Maitland Lecture Hall), lunch in the Board Room and a pathological demonstration in the Maitland Lecture Hall at 1.30 p.m.

July 1, "Observations on 500 Cases of Migraine", Dr. J. W. Lance (neurology clinic); July 8, "Structural Effects of Pressure on Great Veins", Professor F. R. Magarey (Department of Pathology, University of Sydney); July 15, "Pancytopenia", Dr. R. J. Elvy (hæmatology clinic); July 22, "Some Uncommon Forms of Heart Disease", Dr. K. Maddox (Royal Prince Alfred Hospital); July 29, "Chronic Liver Disease", Professor Robert M. Kark (University of Illinois, Chicago, Pfizer Lecturer, 1959); August 5, "Diffuse Pulmonary Fibrosis", Dr. H. P. B. Harvey (by invitation) and Dr. E. Hirst (thoracic clinic); August 12, "Atrial Arrhythmias", Dr. F. L. Ritchie, Dr. B. J. Pascoe (cardiovascular clinic); (August 19, no seminar—meeting of the Royal Australasian College of Surgeons); August 26, "Serological Testing in Syphilis", Dr. S. Fisher (Kanematsu Institute of Pathology).

SEMINARS AT ROYAL NORTH SHORE HOSPITAL OF SYDNEY.

THE following medical seminars will be held at Royal North Shore Hospital on the first Tuesday of each month, at 5.15 p.m. in the Students' Lecture Room.

July 7, "Investigations of Hæmorrhagic Disorders", Dr. H. Kronenberg; August 4, "Hyperparathydoidism", Dr. Lyle Watson; September 1, "Isotopes in Hæmatology", Dr. T. F. Reive, Dr. I. D. Thomas; October 6, "Headache", Dr. M. Sterling-Levis, Dr. Douglas Anderson; November 3, "Porphyria", Mr. W. H. Lockwood, Dr. F. H. Hales Wilson.

On the remaining Tuesdays, at the same time, there will be a case demonstration in the B2 Tutorial Room.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes, etc., are published in the *Commonwealth of Australia Gazette*, No. 25, of April 23, 1959.

AUSTRALIAN MILITARY FORCES.

Regular Army Special Reserve.

Royal Australian Army Medical Corps (Medical).

To be Captains, 1st January, 1959.—Lieutenants NX700472 G. W. Duffy, NX700475 P. N. McGuire and NX700473 M. R. Pittar. [In lieu of the notification respecting these officers which appeared in Executive Minute No. 29 of 1959 and promulgated in Commonwealth of Australia Gazette, No. 18, of 1959.]

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—To be Captain (provisionally), 3rd March, 1959—1/61878 John Hasker Learmonth.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—The provisional rank of 2/127030 Captain C. A. Shearer is confirmed. 2/130123 Captain (provisionally) J. H. Steel-Smith relinquishes the provisional rank of Captain, 26th November, 1958, is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), and is granted the honorary rank of Captain, 27th November, 1958. The following officers are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command):—Captains 2/130102 J. J. Byrne, 29th December, 1958, and 2/127030 C. A. Shearer, 2nd January, 1959. 2/104469 Captain (provisionally) P. M. Mulvey relinquishes the provisional rank of Captain, 12th January, 1959, is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command) and is granted the honorary rank of Captain, 13th January, 1959.

Southern Command.

Royal Australian Army Medical Corps (Medical).—The following officers are appointed from the Reserve of Officers, and to be Captains (provisionally), 12th February, 1959:—Honorary Captains 3/101044 K. F. King and 3/101043 J. D. Callender. 3/101021 Captain J. S. Penington is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command), 22nd October, 1958. *To be Captains (provisionally), 3rd March, 1959*—3/101047 David John Burne, 3/101046 Eustace Julian Keogh and 3/101045 John Coundley Doyle.

Central Command.

Royal Australian Army Medical Corps (Medical).—To be Captain (provisionally), 3rd March, 1959—4/32112 Robert Hecker.

Western Command.

Royal Australian Army Medical Corps (Medical).—5/26529 Captain (provisionally) M. Traub ceases to be seconded whilst in the United Kingdom, 2nd February, 1959.

Northern Territory Command.

Royal Australian Army Medical Corps (Medical).—To be Captain (provisionally), 9th October, 1958—7/3015 Ronald Campbell Webb.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Southern Command.—To be Honorary Captain, 9th February, 1959—Donald Roy Kemp.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales in accordance with the provisions of the *Medical Practitioners Act*, 1938-1958:

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (a) of the Act: Garrett, Mervyn Henry, M.B., B.S., 1957 (Univ. Queensland); Morohan, Ronald Joseph, M.B., B.S., 1955 (Univ. Queensland); Murphy, Brendan Herbert, M.B., B.S., 1952 (Univ. Melbourne); Smith, Winston Sullivan, M.B., B.S., 1936 (Univ. Melbourne).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (b) of the Act: Atkinson, Robert Emmott, M.B., Ch.B., 1952 (Univ. Leeds), D.P.H. (Glasgow), 1958; Barry, William Garrett, M.R.C.S. (England), L.R.C.P. (London), 1952, M.B., B.S., 1952 (Univ. London); Brash, David, M.B., Ch.B., 1942 (Univ. Glasgow), D.M.R. (London), 1945; Game, Margaret Winifred Helen, M.R.C.S. (England), L.R.C.P. (London), 1949; Gibson, William Russell, M.B., 1958, B.Chir., 1957 (Univ. Cambridge); James, Stephen Thomas, B.Sc., 1943 (Univ. Wales), M.B., B.S., 1946 (Univ. Wales); Korn, Charles David, M.R.C.S. (England), L.R.C.P. (London), 1947; Murphy, Edward Joseph, M.B., B.Ch., 1919 (N. Univ. Ireland); Lomaz, Josef, M.B., Ch.B., 1947 (Polish School of Medicine, Edinburgh), F.F.A.R.C.S. (England), 1954; O'Neill, Charles Main, M.B., B.S., 1956 (Univ. London); Shamash, Alan, M.R.C.S. (England), L.R.C.P. (London), 1952, D.A. (London), 1958; Starr, Philip Alan John, M.R.C.S. (England), L.R.C.P. (London), 1956, M.B., Ch.B., 1956 (Univ. Birmingham); Thrupp, Maurice Hugh, M.B., B.S., 1955 (Univ. London); Williams, Winifred Sara, M.B., B.Ch., 1944 (Univ. Wales).

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (2A) of the Act: Szabo, Aladar, M.D., 1915 (Univ. Budapest).

Medical practitioner who has been issued with a Certificate of Regional Registration under Section 21A: Kanarek, Maksymilian, in respect of Urbanville-Woodenbong.

Royal Australasian College of Surgeons.

CONJOINT MEETING WITH THE FACULTY OF ANÆSTHETISTS.

A CONJOINT MEETING with the Faculty of Anæsthetists will be held at the Stawell Hall at 145 Macquarie Street, Sydney, on Wednesday, June 24, 1959, at 8 p.m. The subject is: "Operative and post-operative bleeding." The speakers will be: Mr. R. P. Melville, Dr. R. J. Walsh, and Dr. R. J. Killalea. All medical practitioners are invited to attend.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MAY 16, 1959.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	3	..	2(1)	..	..	..	..	..	5
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	3	..	..	..	..	..	14	..	17
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	1	..	..	..	..	..	..	1
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	1	5(4)	..	1(1)	..	..	..	1	8
Diphtheria	..	..	..	..	1(1)	..	..	..	1
Dysentery (Bacillary)	..	3	2(1)	..	3(3)	..	3	..	11
Encephalitis	..	1(1)	..	..	..	..	..	..	1
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	55(8)	19(10)	15(2)	3(2)	1(1)	..	4	..	97
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	..	..	8(1)	..	..	..	..	..	8
Malaria	..	..	1(1)	..	..	..	..	..	1
Meningococcal Infection	..	2(1)	1(1)	..	..	..	..	1	4
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	1(1)	..	1	..	..	..	..	..	2
Puerperal Fever	..	..	1	..	..	..	..	..	1
Rubella	..	10(9)	1	2(1)	2(2)	..	..	..	15
Salmonella Infection	..	..	..	1(1)	1(1)	..	..	..	2
Scarlet Fever	13(4)	24(22)	..	14(10)	2	1	1	..	55
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	2	1(1)	..	..	..	..	3
Trachoma	..	..	..	..	62	..	84	..	146
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	23(14)	10(6)	12(2)	2(2)	5(5)	5(3)	1	..	58
Typhoid Fever	..	..	2	..	..	..	..	..	2
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

The Royal Australasian College of Physicians.

ADMISSION OF FELLOWS AND MEMBERS.

At a meeting of the General Body of Fellows of The Royal Australasian College of Physicians held in Adelaide on May 27, 1959, the following were elected and admitted to Fellowship of the College: Under article 44: Dr. J. C. Belisario of New South Wales and Dr. Muriel E. Bell of New Zealand; under article 42: Dr. D. A. Ballantyne, Dr. J. V. Cable, Dr. O. W. Chapman, Dr. J. A. K. Cuningham, Dr. A. O. M. Gilmour, Dr. D. McR. Hanna, Dr. J. R. Hinds, Dr. K. H. Holdgate, Dr. J. A. Kilpatrick, Dr. E. G. McQueen and Dr. J. L. Newman of New Zealand; Dr. M. W. Fletcher of Tasmania; Dr. Leo Flynn, Dr. R. L. Harris, Dr. P. J. Markell and Dr. Willa Nelson of New South Wales; Dr. H. R. Gilmore of South Australia; Dr. Bryan Hudson and Dr. W. Hamilton Smith of Victoria; Professor W. B. Macdonald and Dr. W. R. Pitney of Western Australia.

The following candidates, who were successful at an examination held in Australia, were admitted to Membership of the College on May 27, 1959: Dr. James C. Biggs, Dr. T. Burfitt-Williams, Dr. Alan H. B. Chancellor, Dr. E. G. Cleary, Dr. W. R. Hobart, Dr. J. E. Jefferis, Dr. David Jeremy, Dr. Graeme J. Morgan, Dr. John J. Morgan, Dr. M. R. Playoust, Dr. James Rankin and Dr. F. X. M. Willis of New South Wales; Dr. W. C. Boake, Dr. H. D. Breidahl, Dr. J. A. Brenan, Dr. K. D. Muirden, Dr. James R. Syme, Dr. D. C. Wallace and Dr. J. S. Yeatman of Victoria; Dr. Peter S. Hetzel, Dr. G. A. Hunter and Dr. J. L. Waddy of South Australia; Dr. M. J. Eadie of Queensland; Dr. Max N. I. Walters of Western Australia.

Dr. E. S. Finckh of New South Wales and Dr. R. T. W. Reid of South Australia were admitted to Membership under the provisions of article 37.

EXAMINATION FOR MEMBERSHIP.

THE next examination for Membership of The Royal Australasian College of Physicians will be held on the following dates:

Written examination (capital cities): Friday, August 28, 1959.

Clinical examination (Melbourne): commencing on or about Wednesday, October 7, 1959.

Application forms may be obtained from the Honorary Secretary, 145 Macquarie Street, Sydney, and applications should be lodged with the Honorary Secretary not later than Friday, July 31, 1959.

Deaths.

THE following death has been announced:

SUSMAN.—Eric Leo Susman, on June 10, 1959, at Sydney.

Nominations and Elections.

THE undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Ryan, Gerald Anthony, M.B., B.S., 1958 (Univ. Adelaide), 24 Margaret Avenue, West Croydon.

Yates, Lawrence Anthony, M.B., B.S., 1955 (Univ. Adelaide), 10 Rosslyn Street, Largs Bay.

Eadie, Norman B. M., L.R.C.S., L.R.C.P., etc., London, 1926, 8 George Street, Unley Park.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association: Burchmore, John William, M.B., B.S., 1958 (Univ. Adelaide); Sook Ling Lo, Adela, M.B., B.S., 1958 (Univ. Adelaide).

Corrigendum.

In the paper entitled "A Study of Demand Feeding and Rooming-In of Babies", by Jennifer K. Burden, published in the issue of April 18, 1959, on page 521, in the paragraph headed "The Effect of Different Feeding Schedules on the Growth of Babies in the First Week of Life", the last sentence should read "measurements were taken to within a quarter-ounce", not "a quarter-pound".

Diary for the Month.

JUNE 20.—Victorian Branch, B.M.A.: Country Branch Meeting—Warragul.
JUNE 23.—New South Wales Branch, B.M.A.: Hospitals Committee.
JUNE 24.—Victorian Branch, B.M.A.: Branch Council Meeting.
JUNE 24.—South Australian Branch, B.M.A.: Annual Meeting.
JUNE 25.—New South Wales Branch, B.M.A.: Branch Meeting.
JUNE 26.—Queensland Branch, B.M.A.: Council Meeting.
JULY 1.—Western Australian Branch, B.M.A.: Branch Council.
JULY 2.—South Australian Branch, B.M.A.: Council Meeting.
JULY 3.—Queensland Branch, B.M.A.: General Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this Journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in Australia can become subscribers to the Journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 *per annum* within Australia and the British Commonwealth of Nations, and £6 10s. *per annum* within America and foreign countries, payable in advance.